

THE PHONOGRAM.

THE OFFICIAL ORGAN OF THE PHONOGRAPH COMPANIES OF THE UNITED STATES.

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COLUMBIA PHONOGRAPH COMPANY,**

627 E Street, N. W., Washington, D. C.



A MAGAZINE devoted to all interests connected with the recording of sound, the reproduction and preservation of speech, the Telephone, the Typewriter, and the progress of Electricity.

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ADVERTISEMENTS.

THE PHONOGRAM, having special facilities in its circulation through the vast commercial system occupied by the Phonograph, Telephone, and other Electrical Devices, presents an exceptionally valuable advertising medium. The rates are reasonable and will be furnished on application.

CORRESPONDENCE

relating to the Phonograph, Typewriter, or Electricity, in any of their practical applications, is cordially invited, and the coöperation of all electrical thinkers and workers earnestly desired. Clear, concise, well-written articles are especially welcome; and communications, views, news items, local newspaper clippings, or any information likely to interest electricians, will be thankfully received and cheerfully acknowledged.

Shorthand by Mail.

This is the headline of an attractive advertisement appearing in one of the Washington weeklies, and the advertiser states that a complete course of thirty lessons will be sent by mail for a moderate sum.

Now, while such zeal and energy are commendable, and we rejoice in the success of all alert and stirring business men and women, we say in this especial case, stop and consider what those words convey to the unwary and uninitiated who read with avidity each line, pondering these fascinating words and *believing* that at the expiration of thirty days they will emerge full-fledged stenographers.

The statement that "a complete course of stenography comprising thirty lessons will be furnished by mail," though doubtless not intended to misguide, is in fact utterly misleading. True, such a course may confer on the student a smattering of that much-coveted knowledge, but will it enable a pupil graduating from a course of thirty lessons sent by mail to take a place alongside those now employed in that business, and compete with them?

This is the kernel which the student should try to extract from the nut—the question he must decide. It is a part of the mission of THE PHONOGRAM to impart information to its readers and the general public, on subjects appertaining to its own line of business, and it stands ready to perform this office at all times, especially in cases like this where the experience of others may be beneficial.

Premising it as our honest belief that stenography taught by mail will only secure two results, the first being the laying a foundation for future usefulness in the art—the second, that it will have the effect on some minds of making the stenographic system a mystery, we proceed to state that there is now in use a simple instrumentality by which all the tedious and painful steps taken to acquire this intricate art may be avoided—and that is by learning how to operate a phonograph. Any ordinary office boy can, in a few hours, pick up the few easy technicalities required for this, while to learn stenography he would pass long, weary hours in memorizing and learning to write the curves and dots and dashes belonging thereto.

Let this teacher change the advertisement and substitute the following:

"Do you transcribe from the phonograph? If not, why not? A course of lessons at a cost almost nominal will fit you for any office position."

This would be in the line of *progress*, and it goes without saying that such an advertisement would bring scores of answers. The time is fast approaching when inaptitude in phonographic work will be a death knell to the hopes of employment entertained by laborers in industrial fields.

We therefore urge typewriter operators to familiarize themselves with the little instrument now playing so important a part in the world. Take time by the forelock in this matter, so that you first may win the reward of *large salaries*. The hint that women are physically unable to make use of mechanical appliances does not deserve attention, because the majority of typewriter operators are women, and these are of necessity obliged to keep the mechanism of their apparatus in order. Besides, the phonograph can be managed by a child and can be operated with no difficulty. Schools are now established both in New York, Washington and other cities to teach the use of this instrument, and are conducted on strict business principles. So soon as a large corps of trained phonograph operators is known to be ready for service, and business men come to learn that the ordinary routine of office business will be conducted smoothly and uninterruptedly, and with a great saving of time, just so soon will this species of handicraft be brought into requisition and phonograph operators become "all the rage."

The Bradbury Stone Storage Cell for the Phonograph.

We have received a sample of the Bradbury Stone storage battery for phonograph use, and are testing it. Reports come in that this battery is meeting with great success among many phonograph companies. The battery is packed in a most thorough and convenient way for freight and express handling, and the cell is inclosed in a neat wooden case, the whole weighing but little over twenty pounds. Instructions how to set up and restore this battery for the phonograph will be found on another page of this issue.

We understand an agent has been appointed to take charge of the coin-in-the-slot business in New York City and Brooklyn.

Washingtonians' Appreciate the Phonograph.

From the bureau of the *The Evening Star*, a testimonial to the great usefulness of the phonograph emanates, and the writer, who has charge of a department of its business, Mr. Wm. A. Hungerford, enumerates its excellencies most earnestly, and sums up the advantages derived from its employment, by saying that in the near future "it will come into universal use by all busy men who desire to obtain the *maximum* of work at the *minimum* of cost and effort."

The firm of C. A. Snow & Co., attorneys at law and solicitors of patents, Washington, D. C., also write that they keep on hand two phonographs, one of which stands on the desk ready at all times for dictation, while the other is operated by the typewriter for transcribing the cylinders. By this method the work of transcription is never interrupted, which is a great gain in facilitating the progress of correspondence, and Mr. Carroll D. Judson, who occupies a prominent position in the office of Examiner Bureau of Claims, also voluntarily tells us that after six months' experience with it, he is able to dispose of fifty to one hundred letters per day, more easily and satisfactorily than in any other way. Mr. Judson says, "After a thoroughly practical test, I would not discontinue its use." His last sentence is by far the most valuable part of this overwhelming testimony in favor of the phonograph, namely: "Aside from its great utility and convenience in dispatching business, it is *more economical than the employment of stenographers, to which it is in point of accuracy and speed superior, and in no respect that I have been able to discover, inferior.*"

Attention, Manufacturers.

Madame Reynier has sent to us a model of the celebrated battery constructed by her husband the late Mr. Emile Reynier, of Paris. The *patent right to manufacture it* is for sale in the United States. As previously stated in THE PHONOGRAM, it has points of excellence not possessed by other accumulators, and we confidently recommend inventors and owners of accumulators to visit the office of THE PHONOGRAM or communicate with us because we believe that the merits of the Reynier battery must be fully understood to be appreciated. We also opine that when scrutinized this instrument will supply the wants of the public in this line.

Where Shall We Get Our Power, and What Shall It Be?

That the battery question is still of vital interest and importance is evinced by the following communication:

"In circles whose interests are connected with the phonograph, the ordinary comments of the day seem to be directed towards the lack of proper motive power.

"Among those interested in the matter, the consensus of opinion appears to indicate that the batteries now serving the purpose of motors are not always reliable, are not constant and are expensive. Surely, the tests to which the phonograph as a practical and useful instrumentality has been subjected, prove it to be of importance sufficient to rouse inventors to exertion in its behalf and wring from their prolific brains some model which will come nearer to the required standard than those in present use.

"Since storage and primary batteries were introduced, models differing from the originals, and in many instances possessing genuine improvements, have been furnished by the army of imitators always ready to follow in the wake of striking movements. But, so far, the perfect, imperishable motor power, that will stand at all times equal to the task of running the phonograph, is not in sight.

"It therefore behooves those mechanics, and all who are desirous of promoting the complete success of the phonograph, to 'brush the cobwebs from the brain' and see to it that a new, constant and cheap motor be added to the list of such agencies as are still needed to keep the phonograph in the track where it ought to run.

"Letters from men who understand the battery business in all its details come to us from every quarter of the compass, but none of them express pronounced approbation of the batteries now in actual use." X.

[We think our correspondent's experience has been limited, as, we know whereof we speak when we state that there are several excellent batteries now running the phonograph and at a moderate cost.—ED.]

We take pleasure in acknowledging the receipt of the subscriptions from the Kentucky Phonograph Co., a substantial recognition of the appreciation of THE PHONOGRAM from an enterprising and successful company.

Appreciation of the Mission of the Phonograph by Chicago.

The practical ideas of Mr. Gray are in advance of those of his neighbors, yet we can make further suggestions, which future efforts on the part of intending scholars will show to be of great value. A knowledge of the manner of operating the phonograph is not to be acquired "by a few lessons of an hour or so during a couple of days," and it is not the pupil, but the instructor alone, who is capable of judging [as to the degree of excellence which the former has attained in this art.

To become an expert in using the phonograph bestows the power of acquiring wages; and this means that it is *worth paying for*. To learn to use a phonograph properly comprehends a certain dexterity and a perception of certain facts which it requires a trained teacher to impart to the learner. Consequently, a *system* must be devised and taught. This demands great attention and practice, and is therefore worth a price. *This fee should not be returned* to the pupil, because he has received instruction in a money-making art, well worth the price he has paid for it, and which equips him in a short time for more efficient and certain services than shorthand could ever give.

The Phonograph in 1614.

(See illustration.)

The Anglo-Saxon race find constant occupation in digging into the ruins of the past, and by this process extracting information at once useful and interesting.

From Messrs. Holliand Bros., of Ottawa, Canada, we receive a literary production, in which allusion is made to an instrument performing functions similar to those effected by the phonograph.

These gentlemen state that this book, in appearance as ancient and musty as though unearthed from the tombs of the Pharaohs, is in the possession of Mr. Grant Seymour, of Ottawa, by whose courtesy they are enabled to furnish the public with the fact that in past ages man produced inventions indicating the same fertility of brain and powers of appreciation which his descendants now evince.

A French inventor, named Picard, has achieved successful results with simultaneous telephony and telegraphy along the same line of wire.



THE PHONOGRAPH AND THE TYPEWRITER GO HAND IN HAND.

BY E. D. EASTON, PRESIDENT COLUMBIA PHONOGRAPH CO.



TO the vast body of typewriters now existing and to those learning the use of writing machines, the phonograph and the graphophone offer great advantages. Indeed, they perform almost a miracle. They make the typewriter operator *more* than an efficient stenographer, without the labor or expense of learning shorthand.

Until recently, typewriters desiring to reach the greatest possible clerical efficiency have been compelled to learn or attempt to learn shorthand. This complicated and elusive art has had a long and useful life ; but the means it provides for recording and reproducing speech are so cumbrous, so difficult to acquire, and, in the hands of the average person, so unreliable when acquired, that the death knell of shorthand was rung when the first cylinder of a talking machine began to revolve.

A working knowledge of shorthand sufficient at least for office dictation may

be secured after assiduous study for from six months to two years, according to the number of hours per day devoted to the purpose. It is only necessary to learn the use of the talking machine, when, presto ! you are equipped for more efficient and more certain service than shorthand could ever give ; and this, in only a few hours of application.

There are many objections to the use of the typewriter for direct dictation. Its speed can never equal the rate of speech of a fluent dictator. Its noise in operation tries the voice, unless the dictator is silent while the machine is at work, in which case, of course, much less is accomplished.

Some of the advantages talking machines offer the typewriter operator are as follows :

1st. He can work alone. When writing from direct dictation the presence of the dictator is required.

2d. Being entirely independent, he can work at any hour of the day or night.

3d. As he works alone, he can con-

trol the place of work. Night work may be done at home, which otherwise would have to be done at some less convenient place to the operator.

4th. As the operator regulates the speed of dictation by the phonograph or graphophone, he need not impose more work upon himself than he can comfortably execute. In direct dictation the operator often works under tremendous pressure, which is wearing to the nerves and destructive to health.

5th. If the operator is a refined and sensitive lady, as is often the case, she may write out the dictation of the most personally offensive and disagreeable member of the opposite sex, without the infliction of his presence, a necessary evil under the direct dictation system.

6th. A typewriter operator who transcribes from the phonograph or graphophone can accomplish more for an employer, both in quantity and quality of output, than can be done in any other way. The time of the shorthand writer is taken in part in receiving the dictation. Even if accurately taken and transcribed there is here a great waste. Where phonographs or graphophones are used, the principal can dictate to one machine while the clerk is transcribing from another; and, as all of the time of the clerk is spent in transcribing, none in note-taking, a great gain is apparent. The eyes are relieved from constantly studying shorthand characters, there is nothing to do but hear and write, and thus the work is lightened. This point will be appreciated by all whose eyes are weak or sensitive. If the correspondence of the office is not large enough to require constant transcribing, the clerk may be engaged upon other important work for the principal while the principal is dictating.

7th. Writing from phonograph or graphophone dictation insensibly but certainly *increases greatly the speed* of the writer and is the best practice.

8th. While few can afford to dictate directly to a typewriter operator, on account of small product and great consumption of time, yet such an operator, even if not expert, can be utilized economically on the phonograph or graphophone. To use these machines it is only necessary to be able to hear and write, no matter how slow the rate of speed; and the dictation can be repeated mechanically an indefinite number of times, for the benefit of those whose slow perception or key manipulation would try too greatly the patience of a human dictator.

Much has been said about the impossibility of machinery taking the place of brains. This, of course, is true. Brains will always bring a premium in the business world. The marvellous talking machine enables brains to be utilized to a greater extent than was ever before possible in the commercial field.

In view of the impetus given by the phonograph to the typewriter business, the wonder is that every agent for writing machines does not make greater effort to interest operators and the public generally, thereby increasing the use and sale of his special make of typewriter.

In Washington and Baltimore the benefits conferred by talking machines upon typewriter operators are rapidly becoming well understood and appreciated.

The Tea Culture in the South.

The recent attempt to raise tea in North Carolina shows that the soil and climate are favorable to this industry, but, owing to the expense entailed in picking and curing, only the highest grades could be produced with profit.

The Government of Japan gets a large proportion of its revenue from the railroad and telegraph companies that it owns and operates.

Chicago's Practical Appreciation of the Phonograph.

The American Book Company have now had in use in their offices at Chicago for three or four months six of the Edison phonographs. The gentlemen using these machines report them as successful and practical in every way, and of great advantage in saving time in the office. Many more letters are written by the typewritist or copyist who takes the work from the machine in another part of the building from where it is dictated. The use of the phonograph as a business machine is growing in Chicago.

A Few Suggestions.

I have been a constant user of the phonograph in connection with the typewriter for the past year and a half. At first I was in the habit of using the double hearing tube, but both ears being closed to outward sounds it occurred to me to use a hearing tube with only one outlet. This I have been using for the past twelve months. The result is that I can hear everything going on in the office as well as though I had no tubes in my ears. I assist the voice of the dictator by having what I term a perfect knife, the result being that on all the blanks used here no other sound can be heard but the voice. The ear bulb I use has a shorter bend than the regular bulb, so that it leans more against the face and rests securely in the ear. The rubber tube is about half as long again as the ordinary one, giving full play to the hand or arm in any way.

If phonograph operators would adopt these few suggestions there would be less "kicking" against the machine.

W. M. BENNER.

Forty-one electric light plants have been established in the South during the past three months.

Conclusive Testimony of the Efficacy of the Phonograph in Curing Deafness.

For the purpose of learning how much truth there was in the claim that a discovery had been made for the certain cure of deafness by means of the phonograph and whether the method was being used in Washington, and if so, who was the first physician to adopt it here, the writer called upon Dr. George A. Leech, specialist in diseases of the eye, ear and throat, and requested from him a statement in reference to the matter. The Doctor was at first reluctant to talk for publication, but finally consented, "in the interest of humanity," as he put it, to make the following statement: "When I first heard of this adaptation of the phonograph to the cure of deafness I was naturally skeptical, but I concluded to thoroughly investigate it before passing judgment. I visited Dr. Garey's clinic in Baltimore, questioned his patients who had been cured, also those then undergoing treatment, and was truly surprised and astonished at the successful results. I became so convinced of the efficacy of the method employed, and the wonderful results that have been and can be accomplished, that I have, as you see (pointing to the patients who were being treated) already adopted the method with my own patients, both in my clinic and private practice.

"My success has been simply phenomenal, and, considering the simplicity of the principle now it has been discovered, I am surprised that this adaptation of the phonograph to the cure of deafness was not earlier discovered by the great lights of the profession, whose reflected brilliancy has been shining down upon us. But it is a repetition of the same old story, proven again and again, especially in science and matters of invention, and in all great discoveries. Upon the phono-

graph has fallen the credit of being the means by which deafness should be cured; and upon Dr. Garey, of Baltimore, has devolved the honor of discovering the adaptation of the means to this end. So let all honor be given to Edison, who invented the phonograph, and to Dr. Garey, who discovered its adaptation for the cure of deafness."—*Washington Daily Post*, February 21, 1892.

A public demonstration was given recently at the Southern Homeopathic Hospital in Baltimore, by Dr. H. F. Garey, who has made a discovery that by using the phonograph the deaf may be cured.

His principle is, that the sound emanating from the instrument produces a massage of those parts of the ear which transmit sound to the brain, by giving continuous and successive vibrations at regular intervals. This it does with certain degrees of intensity and frequency, according to the exigencies of the case. In bad cases, a series of intensified shocks at the rate of one to the second is produced against the drum. In cases of not over five years standing, the vibrations are given with more frequency and less intensity.

All patients who are under treatment for deafness at this college report that they have been greatly benefited.

Fifteen Years with the Marine Band.

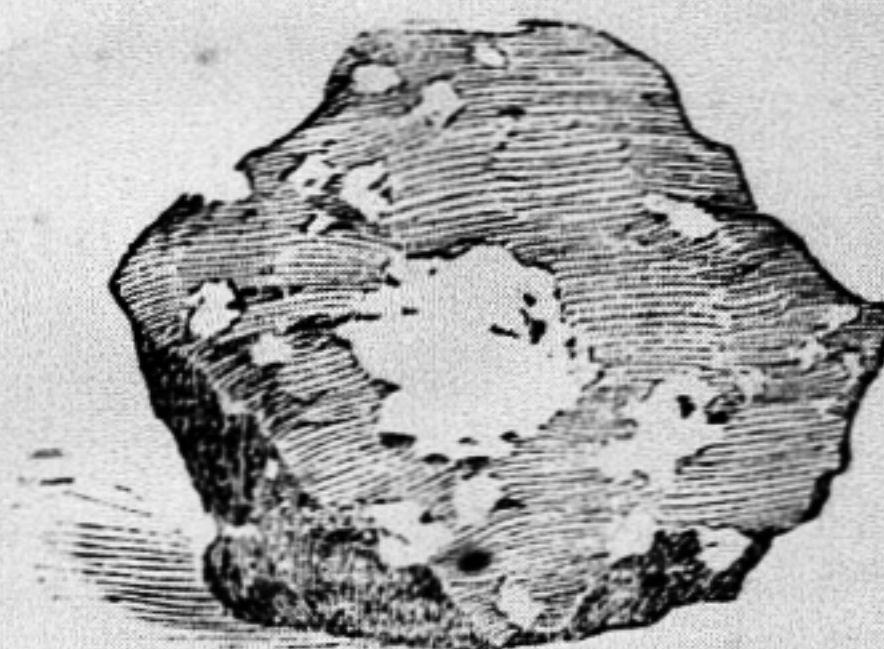
Mr. Geo. W. Sousa completed fifteen years' service in the Marine Band on the 8th of February last, and took one day off to celebrate the occasion. He enlisted on the 9th for five years more. He is librarian of the band and one of the handsomest as well as most popular of its members. No greater evidence of his attachment for his comrades could be imagined than his staying out of the fold only one day. He is a brother of John Philip Sousa, who is the leader of this famous musical organization, which gives through the phonograph the finest music in the world.

A Meteoric Stone Containing Gold.

We are informed that Mr. H. W. Turner, geologist, of Washington, D. C., has been engaged for some years exploring the gold-bearing sections of the Sierras, under the direction of the California Division of Mining Geology.

While engaged in this manner, he came upon a piece of stone containing gold, the exact locality in which it was found being near Cave City, Calaveras County.

The cut shows the nugget about one-half its actual size. It is covered at

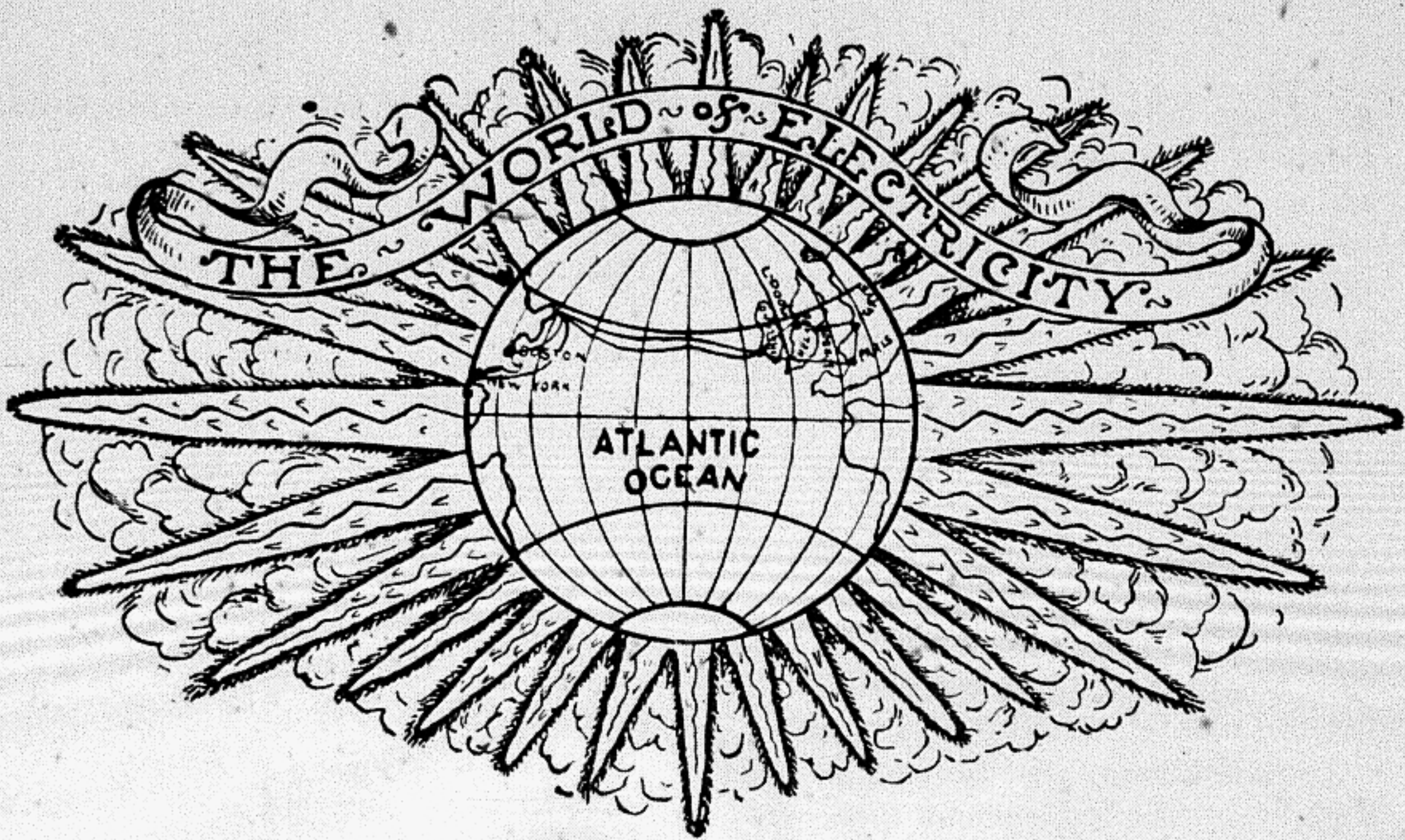


intervals by a thin crust of gold, in one place the metal showing about an inch square. Mr. Turner's find is important, as heretofore the most thorough research has failed to discover the least trace of this metal, the component parts being iron and nickel. The meteoric iron is very malleable, though tough, and contains, besides nickel, also cobalt.

This specimen will be sent to the Smithsonian Institute at Washington.

It used to take thirty-five days to make a carriage. It is now made by the aid of machinery in twelve days.

Congressman Clancy and Postmaster Collins, of Brooklyn, advocated recently before the House Post-Office Committee, an appropriation of \$90,000 to establish pneumatic tube connection between the New York and Brooklyn Post-Offices by way of the Brooklyn Bridge.



HONORS TO "ONE OF AMERICA'S GREATEST MEN OF SCIENCE, THE LATE PROFESSOR JOSEPH HENRY."



BELONGING to the educated classes in our country were many scholars, professional men and students cognizant of the reputation and rank held by our distinguished fellow-countryman whose name heads this article, but with the masses it was an unfamiliar sound, and his enrichment of scientific learning, especially in the matter of the introconvertibility of electricity and magnetism, it now appears, was unknown in the Old World. The fact that Franklin's justly celebrated discovery and achievement became more widely known in a less space of time, is due to the differing conditions of environment in which these scientists stood. Franklin was a printer and publicist; his efforts and progress in the field of scientific discovery rendered him a notable figure in the early days of our republic, when few men had the opportunity to travel in that path, and also for the reason that he was able to disseminate his attainments by the

aid of his own printing press; while at the same time the recognition of his abilities by the Government of the United States, as evinced in his appointment to a highly honorable office which required his presence at the court of Louis XVI., gave him a chance to secure wide publicity for his remarkable exploit.

The duties in which Professor Henry was engaged were exacting and laborious, his studies abstruse and his researches exhaustive. To paint fully the situation, it may be said that he was entirely engrossed in his studies and gave no thought to renown. What wonder is it, then, that another should celebrate his conquest in the field of glory by hoisting the flag of victory?

Two leading journals in this country are now engaged in the noble task of maintaining the claim which during his lifetime his contemporaries freely awarded him, of being the discoverer of magneto-electricity. These are *The Electrical Engineer* and *The Manufacturer and Build-*

er, each prominent in its special domain. The first published a series of articles from the pen of the daughter of Professor Henry, Mary A. Henry, a lady whose erudition is only equalled by her filial devotion. The statements she here makes in defense of her father's claim cannot be controverted, the proof, as laid down step by step, is irrefragable; and if she had not been called upon by the powers that constitute that able organization called *The Electrical Engineer* to perform this duty, other champions would have sprung up from American dust to declare the same. The polished writer, Dr. William H. Wahl, whose editorial on this subject occupies two columns in *The Manufacturer and Builder*, and whose friendship for the learned professor is announced with commendable pride, defends Henry's title to the authorship of this discovery, and adds:

"In view of the vast importance which the varied applications of magneto-electricity have at the present day assumed in the electrical world, the publishers of *The Electrical Engineer* have felt that the time has come when an authentic chronicle of the researches and discoveries of Professor Henry in this interesting and important field should be made known in the world."

The Manufacturer and Builder publishes the statement that when the delegates of the American Institute of Electrical Engineers returned from the Congress held in Frankfort, Germany, during the term of the Electrical Exhibition at that place, they made known to their countrymen the fact that when the proposition was made by the American repre-

sentatives to name after Henry (in accordance with the custom which has given us the ohm, the volt, the farad, etc.) an important new unit applying to facts that he was the first to observe and investigate, the proposition failed of assent, and action thereon was postponed until the Chicago Electrical Congress of 1893, for the reason that many of the European delegates "had never heard of Henry." If this astounding statement be true, as we believe it is, it should be the imperative duty of the American Institute of Electrical Engineers to see that these gentlemen are better informed respecting the services of our distinguished countryman before they reach Chicago."

The Electrical Engineer says: "The developments of the last ten years have rendered it as certain as any future event can be, that the introconvertibility of electricity and magnetism, first made known to the world in 1831, by the English philosopher, Michael Faraday, is one of which the results are destined to be of greater importance to the welfare



PROFESSOR JOSEPH HENRY.

of the human race than any other ever achieved by the mind of man. 'I cannot help thinking,' says Tyndall, the successor of Faraday in the Royal Institution of Great Britain, 'that this great discovery of magneto-electricity is the greatest experimental result ever obtained. It is the Mont Blanc of Faraday's own achievements. He always worked at great elevations, but higher than this he never attained.'"

Now Professor Henry mentioned repeatedly to his wife and daughters that he had made the discovery of the extra current five years before Faraday.

Rev. Theodore L. Cuyler, D.D., one of Henry's earliest pupils in Princeton, said recently to one of his daughters, "Your father often spoke to me of his disappointment about that discovery. 'I ought to have published, but I had so little time. I desired to get out my results in good form, and how could I know that another on the other side of the Atlantic was busy with the same thing?'" This was what Henry said to Dr. Cuyler.

It seems he was making preparations for this purpose, when one day, in the library of the Academy, he opened a newly-arrived periodical and found that Faraday must claim it.

His daughter describes the making of the great magnet with which he conducted the experiment in reference to the production of electricity by magnetism. He had to stand over the workmen while they forged the bar, weighing 101 pounds; he insulated with his own hands a *mile of wire*; he bent a bar of iron weighing 101 pounds. The preparation of a magnet for Professor Cleaveland occupied two persons and himself every evening for two weeks; this reel of wire was 1,000 feet long. To wind the mile of wire must have required at least a month.

A Wonderful Demonstration with the Electro-Magnet.

Mr. Dewar has recently succeeded in producing at the Royal Institution, in the great amphitheater where Faraday conducted his work, and with the great electro-magnet used by him to carry on his experiments on the polarization of light, some very curious demonstrations. It is known that Faraday had shown that oxygen is a magnetic gas, but one may perceive how difficult it would be to make evident these magnetic effects when the state of molecular diffusion of a gas whose density is seven thousand times less than that of iron is given.

Mr. Dewar has set aside this difficulty by acting upon liquified oxygen at a temperature of eighteen hundred below zero. Having placed a crystal vase containing the liquified gas between the two poles of the great electro-magnet, he has seen, as soon as an energetic current passed into the solenoid, the liquid mass uplifted and changed as if it had been iron filings.

Two Years and a Half with Edison.

NEW YORK, February 23, 1892.

DR. FRANK M. DEEMS, Orange, N. J.

DEAR SIR:—Knowing that you enjoyed for over two years the inestimable privilege of the companionship of Mr. Thomas A. Edison, and that the public reads with avidity all information regarding him, I write to say that I shall be glad to hear from you on this subject.

You have been so thoroughly indorsed wherever your lecture on Edison was delivered, and so fully warrant the opinion expressed by the *Public Opinion*, of Westernville, Ohio, as being "the right man in the right place," with respect to Edisonian matters, that I believe a communication of this sort will be sure to please. As you were formerly a contributor to THE PHONOGRAM, in the days when this bark was first launched, I should also be glad to introduce your photograph by the side of those other scientists, inventors and writers that have adorned its pages.

Respectfully,

V. H. McRAE,

Editor of THE PHONOGRAM.

Editor of THE PHONOGRAM:

The first time I ever saw Thomas A. Edison was in March, 1878, and it came about in the following way: I was at that time a laboratory instructor and assistant to the Chair of Chemistry and Physics in the Medical Department of the University of New York. That Chair was at the time ably and worthily filled by the late Dr. John C. Draper, one of the best teachers of science I have ever met. One day, while I was setting the apparatus and experiments in order for his lecture, he said:

"I want you to go over to Menlo Park

to-morrow morning and get a phonograph for our department from that rising young inventive genius, Thomas A. Edison. He is giving them away to leading scientific institutions, in order to introduce them."

"A what?" I asked.

"A phonograph—a talking-machine. He has just invented a machine that actually talks. It is to sound what a mirror is to light—a faithful reproducer. Such an instrument must be of invaluable service to those who teach acoustics. By the way, I hear he is trying to solve the problem of the subdivision of the electric current. I think he will find that a bigger contract than inventing even a talking-machine."

Here was at least one eminent *savant*, himself an original investigator, who, fourteen years ago, recognized, what all the world knows *now*, that Thomas A. Edison is a genius. It also shows what was then the unfound key to the successful solution of the incandescent electric light.

Armed with a letter of introduction, I went out the next day to the now historic workshop of the "rising young inventive genius," and I shall never forget that visit. Mr. Edison had been up till four o'clock that morning with his "mirror of sound," and it was "high noon" when he came over to his laboratory. After reading Prof. Draper's letter, he took me back to the rear of the long gallery-like room, whose walls were literally festooned with wires, and there upon a table was a little machine about the size of a coffee-grinder. Adjusting a piece of common lead foil round a brass cylinder, on an axle provided with a screw thread, which worked in bearings also with threads, thus giving a lateral motion to the cylinder and its axle, he revolved the foil-covered cylinder by means of a crank-handle at one end. While so doing he talked English, French



and German into the ear-like funnel, and coughed and whistled and laughed and sung, and wound up this curious performance with a startling imitation of "the cock that crows in the morn" (something he generally heard in those days *before* going to bed). Setting the funnel back to its original position, he again turned the handle and—well, your readers will know how I felt by recalling their own sensations when, for the first time, they heard a phonograph talk. The college got its phonograph, and the very next day a company was formed to place it on the market.

The next time I saw Mr. Edison was in December, 1887, nearly ten years later. This time I went to his present new and unrivalled laboratory at Orange, N. J., and for the purpose of entering his ser-

vice. I was struck with the great charges in his personal appearance. Moreover, the rising young inventive genius of '78 had made those ten years very eventful ones for himself and the world. He had subdivided the electric current, and thus had made the incandescent light a solid commercial fact; he had made the telephone a far more valuable instrument by making it a long-distance talker; he had done many other useful and profitable things. He was more than ever the "Wizard" to an admiring public who had learned to expect great things from him. He was now high in the heaven of scientific fame, and was still a "rising young inventive genius." The sound of saws and hammers, putting the finishing touches on the greatest private scientific workshops in the world, almost precluded the possibility of conversation. Our interview lasted forty-five seconds. He rapidly looked me over from head to foot with a searching eye, asked me just two questions, and said:

"All right; come to-morrow."

The next day he assigned me a table in the chemical laboratory, and in less than two minutes he laid out work that took me three months to finish, without his having to add a single further suggestion. Nearly every day he made a tour of inspection among the thirty or forty "experimenters," as we were called, and the fifty to sixty skilled mechanics. Among other things that excited my perpetual astonishment was how he managed to keep the heads and hands of such a staff of trained men almost feverishly busy. If ever there was an intellectual dynamo, that man is Thomas A. Edison. Of course, I could fill pages of reminiscences about him and his way of doing things, but printed pages are not elastic. For nine months I worked at making carbon in a hundred different ways; at making an ideal insulating material; at the best pos-

sible composition for phonograph cylinders. Then I was transferred from the chemical laboratory to a department of my own, where for eighteen months I was engaged in special microscopic work, with a view to finding the best possible anti-septic or germicide.

After twenty-seven months in his service I left his employ. But what I had seen and learned of him while thus associated with him, so profoundly impressed me with the greatness and versatility of his inventive genius, with the value and importance of his numerous inventions, with the brilliant and almost dramatic character of his career, and with the strong and unique personality of the man, that I felt convinced that the public would be interested to learn as much as possible about their illustrious fellow-countryman. So I decided to make a lecture of him. And as an illustrated lecture can be made to contain an immense amount of positive, accurate knowledge, I chose that method of so doing. I have had no cause to regret it, thanks to a generous public.

Engravings of Phonograph Officers.

We have a limited number of reprints, on fine paper, with large margins, of the officers (including Mr. Edison) of the different phonograph companies, same as appeared in the holiday number of THE PHONOGRAM.

The work is finely executed and will make a handsome and fitting souvenir to adorn the wall of anyone's home or office.

The prices are: \$3 per doz. (six of each group of officers); 75c. per one-sixth doz. (one of each group of officers). Same framed, \$2.50, \$3 and \$4.50 each; 25c. for packing. Address

V. H. McRAE,
Room 87,
World Building.

The Electric Boat "Zurich."

This boat, which was on exhibition at the Electrical Exposition in Frankfort, was constructed at the Oerlikon shops, and by Messrs. Escher, Wyss & Co. It is capable of carrying one hundred persons. Its hull is of steel, its deck is entirely covered, and in the rear there is an elegant cabin of pitch-pine.

The energy is furnished by a battery of fifty-six Oerlikon accumulators, presenting this specialty, that the electrolyte is almost entirely immersed in a precipitate of gelatinous silica; there only remains, therefore, a thin layer of liquid open at the surface, and this liquid would scarcely be affected by the rolling of the ship, so that it would be useless to hermetically

law of the cube of speed is thus approximately verified if one keeps account of the difference of the return made by the motor and the helix.

The accumulators of the machine are placed in the hold. The pilot has under his eyes the volt meter and the ampere meter, mounted on a horizontal tablet, he maneuvers from the same place, the rudder, the rheostat of the motor, the commutator of change of speed, and has equally under his hand the divers interruptors and rheostat for lightning. There is an arc-light in the front.

Looking at the success obtained in this and other trials, it would seem that electric navigation, especially as applicable to rivers, is a fixed fact. The employment of electric motors will cause improvement in pro-

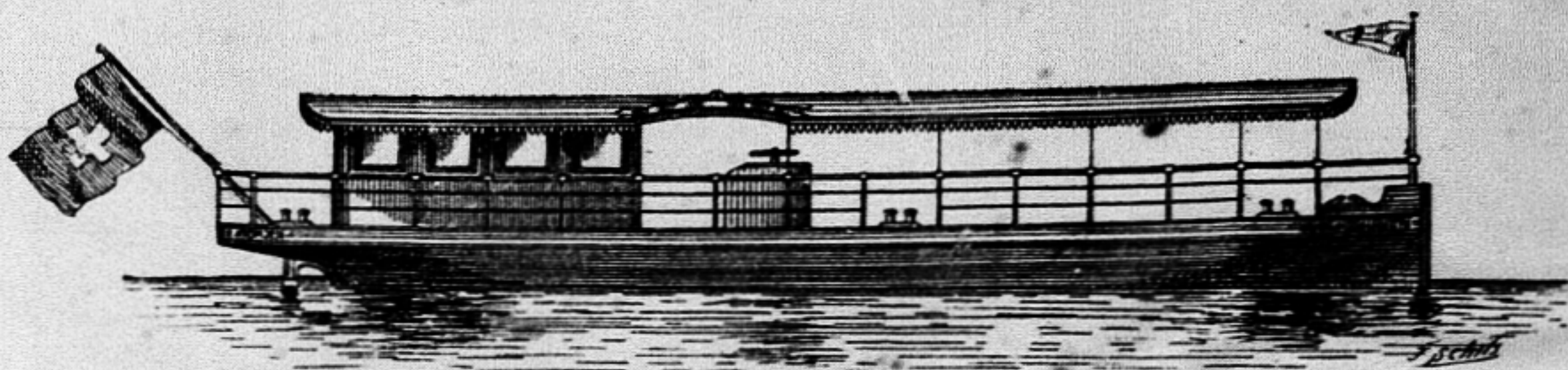


Fig. 1.

close the vessels. Moreover, the plates being perfectly protected, the fall of the active matter is practically impossible. The employment of this gelatinous electrolyte does not seem to reduce to any important extent the outfit of the accumulators, as the battery in question, having a capacity of 450 ampere hours, weighs about five tons and can be discharged at the rates of eighty amperes.

Each element contains thirty-one plates. The total weight of the electrical part is 6,500 kg., that of the boat is 15,000 kg. The motor absorbing 75 amperes at the tension of 102 volts, and making 365 revolutions a minute, sends the boat forward at the speed of 12 km. an hour. With 58 amperes at the same tension, the speed is still 11 km. This shows that the

pellers. Moved by steam these are uncertain; but with the electric motor they afford satisfactory exactness.

Advance of Science in Japan.

From the *Journal* of the College of Science at Tokyo, we learn that the Japanese are a people already far advanced in the sciences of paleontology, seismography and physics; and we have reason to believe that in time and under proper guidance there will spring up in Japan a public composed of scientists, seekers of learning and men of general erudition, who will do honor to their country.

The great Lick telescope reveals about 100,000,000 stars, some so small that it would require 30,000 of them to be visible to the naked eye.

THE ELECTRIC LIGHT CONVENTION AT BUFFALO.

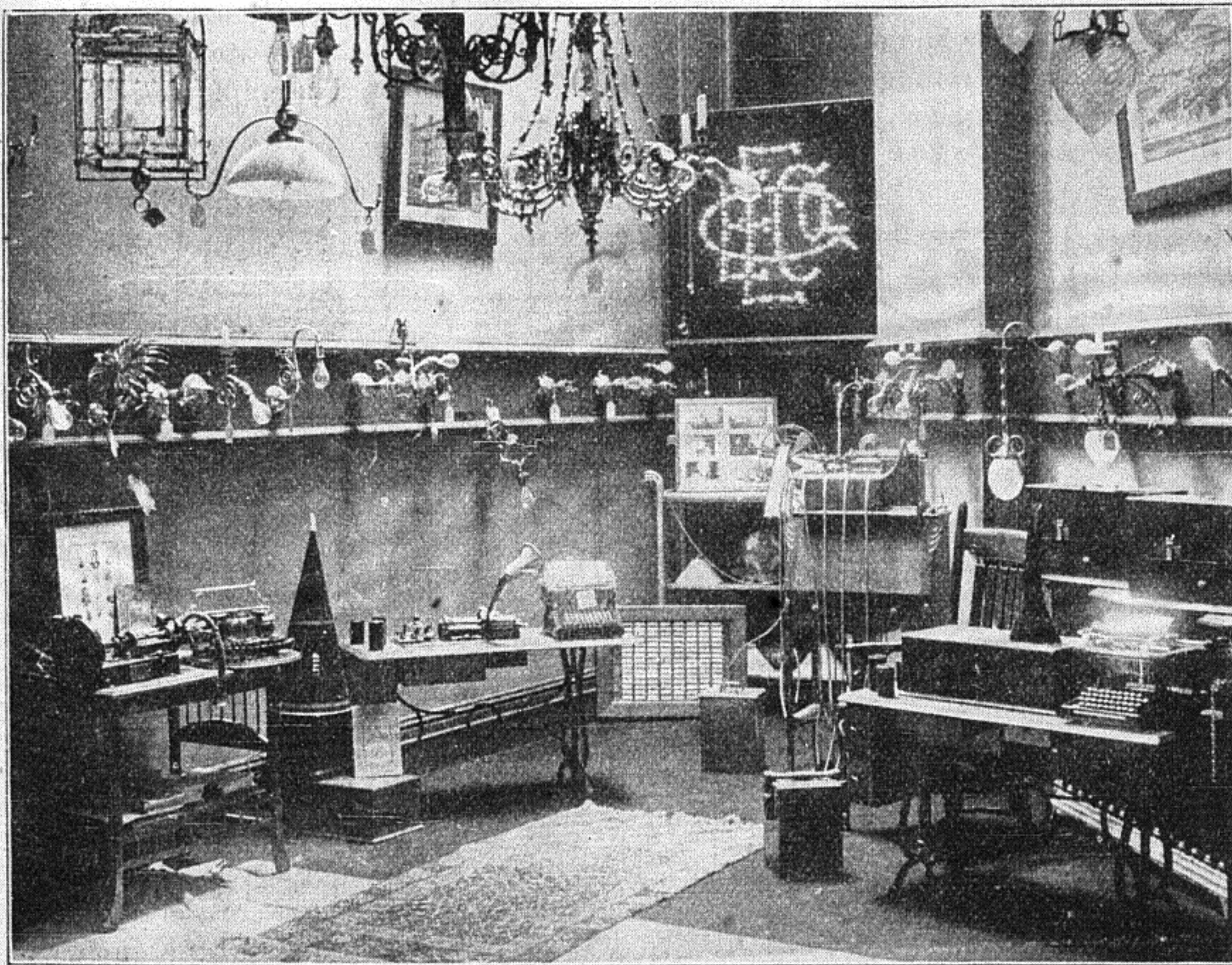
The Fifteenth Annual Convention of the National Electric Light Association was held in Buffalo, N. Y., on February 23d. An address of welcome was made by Mayor Bishop, of Buffalo, and responded to by Charles R. Huntley, the president of the association.

This convention was a marked success and reflected credit upon those who conducted affairs. Papers were read upon the most interesting topics connected with electricity; the speakers were a galaxy of

by the citizens of Buffalo was a most enjoyable affair, and cemented more closely the ties of friendship between the guests and their hosts.

The trip to Niagara was one of the most attractive features of the convention, and demonstrated the immensity of the undertaking to furnish power transmission at long distances.

One of the handsomest displays was that of Mr. H. D. Pulsifer, the popular agent of the New York Phonograph Company.



stars in the electrical firmament, which was sufficient to insure appreciation.

These discussions were upon subjects of the utmost importance and were entered into with great enthusiasm.

A banquet tendered the Association

The accompanying cut gives a good view of phonographs and typewriters in readiness for business purposes; and the arrangement of electric lights adds much to the general effect.

The picture of Mr. Edison and the

president and vice-president of the North American Company, surrounded by the presidents of the various sub companies, as appeared in the holiday number of THE PHONOGRAM, stands to the left of this plate, handsomely framed. Mr. Pulsifer deserves great credit for the display, and his usual energy brought him large rewards in the shape of contracts for phonographs.

Mr. Pulsifer was invited to join the members in their trip to the Falls and speaks eulogistically of the wonders to be seen in the tunnel, where work is progressing rapidly.

Prof. Elisha Gray, chairman of the electrical congress of the World's Fair, explained in a most interesting manner the electrical plans for the Fair, and Mr. Erastus Wiman, of New York, followed in his easy and delightful style, showing the earnings of various electric light plants, quoting the opinion of a man who is director of five city companies, who claims that small profits are due to misrepresentation on the part of owners as to economy in production, and giving as his conclusion that there is an "enormous demand for electric lighting."

In conclusion he says: "The whole electrical community are watching with intense interest the possibility of the development in this city of Buffalo of electrical transmission of power arising out of the successful effort which is now being made to harness the power hitherto latent in the Niagara River. A survey of the electrical business world is full of the deepest interest. This new and mysterious force has achieved more for the advancement of the country than almost any other, in the provision of the means of instantaneous communication, in its usefulness to railways, in its lighting remote localities, and in its adaptation for traction and street railways. More money has been made out of its introduction than in almost any other department of human activity."

The Electric Atom.*

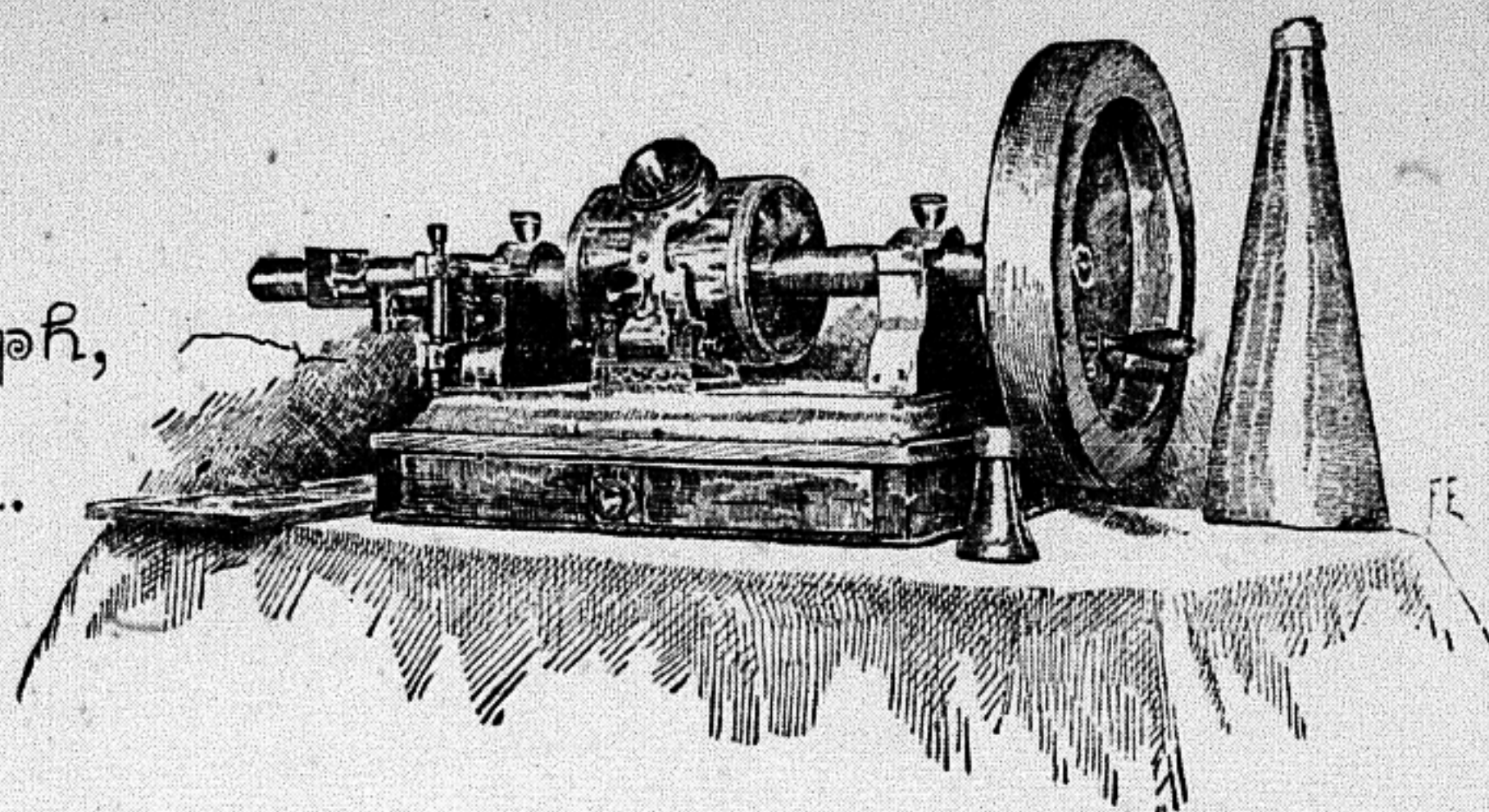
We have very fortunately repudiated that absurd belief which asserts that all research into science pure is but a waste of time; in these days, it is, on the contrary, generally admitted that science pure, outside of its practical application, benefits at the same time the seeker who strives to penetrate its mysterious laws and society which is sure at last to derive advantage from it. Between the frog's legs quivering on the table of Galvani and the most precious telegraph and telephone, there is direct filiation. Without the one, we should still be deprived of the other.

We know but little of this mysterious agent which we call electricity. The materialists tell us it is a sort of matter. Others see in it, not matter, but a form of energy. Others still, repel these two conceptions. Mr. Lodge considers electricity as a "form, or rather a mode of manifestation of ether." Mr. Nicolas Tesla does not view it in this way, and thinks that "nothing interferes with conceiving electricity as well as ether to be associated with matter." The highest scientific authorities are not yet in accordance as to the question of the existence of one electricity or two contrary (or opposite) electricities. The only means of dissipating the shadows that surround the subject, is to continue with perseverance experimentation and observation. Besides, while admitting that these researches do not permit us to penetrate even the nature of electricity, nor to decide if we ought to consider it an element of life or an element of matter, if, in short, electricity must always remain for us—unknown, we may at least be able to attain further knowledge of its attributes and functions.

It is incontestable that the study of

* A lecture delivered at a reunion of the Society of Electrical Engineers of London by Sir William Crookes.

The
Phonograph,
in 1614.



ALBUMAZAR

(Charles Seymour)

A COMEDY PRESENTED BEFORE

The Kings Majesty at Cambridge, the ninth of March,
1614.

By the Gentlemen of Trinitie Colledge,
London.

Printed by Nicholas Ores, for Walter Burret,
and are to be sold at his shop in Paul's Churchyard, 1615.

The great Albumazar by wondrous art,
An imitation of this Peropiscill, [A telescope described in a previous
portion of the play.]
Hath framed an instrument that multiplies
Objects of hearing, as this doth of seeing,
That you may know each whisper from Prester John,
Against the wind as fresh as 'twere delivered
Through a trunk, or Glasse's listening wall.

Pandolfo.—And may I see it, Sir? Please me once more.

Ronco.—'Tis something ceremonious, but you shall try it
Stand thus. What heare you?

Pandolfo.—Nothing.

Ronco.—Set your hands thus,

That the vertex of the Organ may per-
pendicularly point at our Zenith. What
hear you now? Ha, Ra! Ra!



Pandolfo.—A humming noise of laughter.

Ronco.—Why that's the Court and University
that now are merry

With an old Gentleman in a Comedy.

What now?

Pandolfo.—Celestial music, but it
seems far off.

Is't, list 'tis nearer now.

Ronco.—'Tis music 'twixt the acts. What now?

Pandolfo.—Nothing.

Ronco.—And now?

Pandolfo.—Music again and strangely delicate.

O most angelical! They sing!

Ronco.—And now?

Sing sweetly that our noses may cause
The Heavenly orbes themselves to pause:

And at our music stand as still?

As at Coues Armourous will.

So now release them as before

So have waited long enough, no more.

Pandolfo.—'Tis gone, give me't again.—O doe not so.

Ronco.—What heare you now?

Pandolfo.—No more than a dead Cypher.

O let me see this wondrous instrument.

Ronco.—Sir this is called an Otacousticon.

Pandolfo.—A Cousticot?

Why 'tis a paire of asses eers; and large ones.

Ronco.—True: for in such a forme the great Albumazar

Hath framed it purposely as fit't receivers

Of sounds as spectacles fike eyes for sight.

Pandolfo.—What gold will buy't?

Ronco.—I sell't you when 'tis finished.

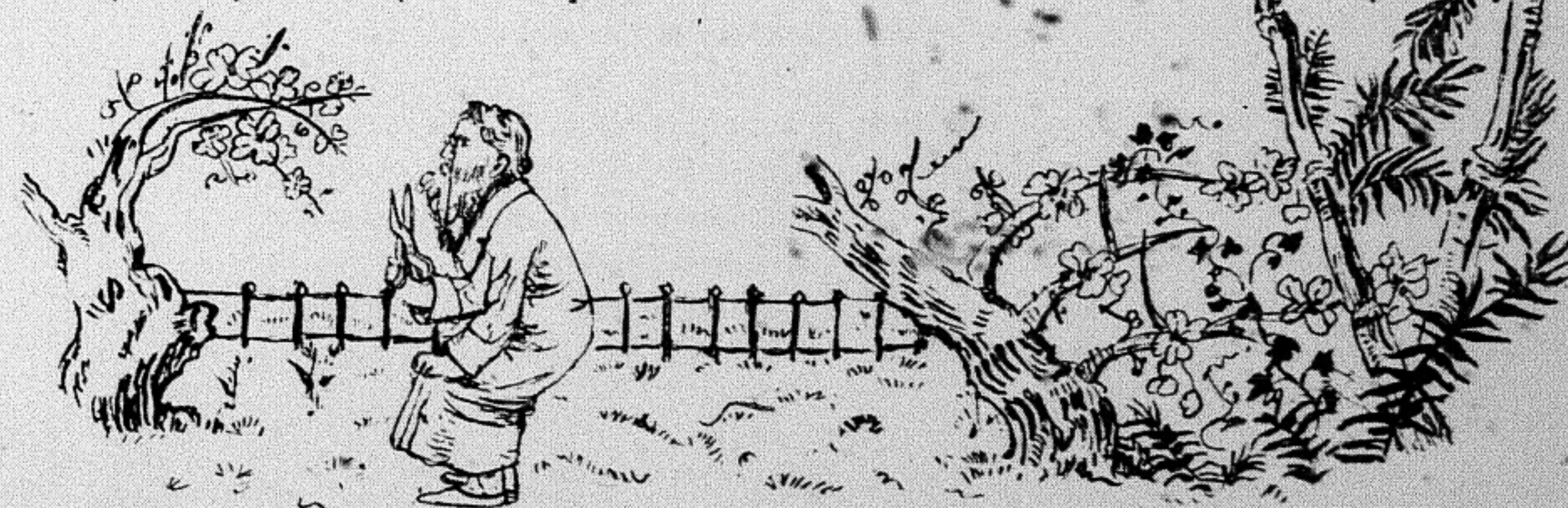
As yet the Epiglotis is unperfect.

Pandolfo.—Soone as you can and here's ten crowns in earnest.

For when 'tis done, and I have purchased it,

I meane t'ntail't on my heires male for ever,

Spile of the rapture of the common law.



electricity has thrown a new light upon numbers of chemical phenomena, whether produced in our small laboratories or in the grandiose laboratories which the earth and the sun create. The old electrochemical theory of Bergelius has become superannuated and forced to give place to a new and wider theory. The facts which mark the phenomenon of electrolysis, though very far from being completely elucidated, seem nevertheless to indicate that in all probability electricity is atomic, that an electric atom is a quantity as definite as the chemical atom. Now, if one considers that the electric attraction between two chemical atoms is a trillion of times greater than the attraction of gravitation, one perceives what a preponderating influence this electric attraction ought to have in chemical action.

It has been calculated that a single *décimètre* cube of the ether that fills space holds in store more than 110,000 kilogrammètres of energy, which hitherto has not been liberated. To place this prodigious quantity of energy at the service of humanity, is the task of the electricians of the future. Moreover, the latest researches on this subject are of a nature to justify the hope that this vast natural storage of energy is not irremediably inaccessible. Up to the present, we were only acquainted with a very limited series of ethereal vibrations, from the extreme red on one hand, as far as the ultra violet on the other, that is to say, from three ten-millionths of a millimètre to eight ten-millionths of a millimètre. It is between the relatively narrow limits of the vibrations of ether and the not less contracted vibrations of sound that we have heretofore been obliged to restrict our researches. As far as these latter times, we have never labored seriously to ascertain if the vibrations of ether—less rapid than those which affect our senses under the form of light—were capable of con-

tinual action around us. But the labors of Lodge in England and of Herz in Germany, have shown us a series almost infinite of ethereal vibrations or electric rays, whose lengths of undulation vary from thousands of kilomètres to some *décimètres*, discovering to our wondering eyes an entire new world.

Experimenters reduce the lengths of the undulation of the electric rays; according to the diminution of the dimensions of the apparatus, the lengths of the wave become shorter and if we could construct some Leyden jars of molecular dimensions, we should be able to obtain rays that would fall within the narrow limits of visibility.

It is not improbable that the discontinued phosphorescent light emitted by certain bodies when placed in a close vacuum and submitted to the action of a current of high tension may be nothing more than an artificial production of electric rays of this nature, or of waves sufficiently short to affect our visual organ. A light of this sort, if it could be produced more easily and in a more regular manner, would be infinitely more economical than the light of a flame, or than that of the electric arc, for there is absorbed under the form of caloric rays only a feeble part of the energy put into play. Nature furnishes us, besides, with examples of this phosphorescent light in the glow-worm and the *ignis fatuus*. The light they emit, although sufficiently powerful to be seen at a considerable distance, is not accompanied with any disengagement of heat capable of being reported by even the most delicate of our instruments.

In using alternating currents of high frequency, Mr. Nicolas Tesla has succeeded in causing a quantity of energy sufficient to maintain a filament in the state of incandescence, to pass by induction across the glass of a lamp without using the wires of communication. He

has even been able to light a room by producing in it a condition such that the lighting apparatus could be placed no matter where, and would give a light without the need of establishing electric communication. He had obtained this initial condition by creating a powerful electrostatic field alternating rapidly, and in attaching respectively to each extremity of the circuit two sheets of metal, so that a tube in which a vacuum had been effected became luminous as soon as it was placed between these two sheets, or no matter where.

Experience alone can determine the practical value of this mode of lighting. The facts show, in all cases, that the ordinary electric machine ought to cease to be regarded as a simple toy.

Alternating currents have a reputation somewhat doubtful; the results, however, of Mr. Tesla's experiments demonstrate that the dangers arising from their employment do not increase with the rapidity of their alternation, but, on the contrary, diminish. It seems, besides, that a veritable flame can now be produced without any chemical intervention—a flame producing light and heat without any consumption of matter or any chemical combination. To this end, methods must be devised which permit the production of alternations excessively frequent and of enormous potentials.

Shall we accomplish that purpose by utilizing ether and the inexhaustible resources of energy that it holds? If this takes place, we may regard with indifference the perspective of the exhaustion of our mines of coal. And with the same stroke we shall be able to settle the question of how to dispose of our smoke.

Electricity appears destined to secure the whole domain, not only of optics, but also probably of thermo-dynamics. Luminous rays cannot traverse walls, nor, as we know but too well, a thick fog, but the

electric rays of one or two feet ($0^m 30$ to $0^m 60$) of length of undulation, of which I have spoken, would easily pierce centers of this sort, which by these rays would become transparent.

Another field of research, and one not less tempting, though, so far it has not been entered, is open to explorations. I would speak of the mutual action of electricity and life. No philosopher of sound mind would indorse the assertion that "electricity is life;" we would not even risk the statement that life is one of the manifestations of energy. But, on the other side, one could hardly deny the important influence of electricity upon vital phenomena any more than the calling into action of electricity by animal or vegetable life. We have the electric fish—prototype of the torpedoes of our modern wars; we have the electric snail, the electric scolopendra (thousand-legs).

There is in this path an almost infinite field of researches for the electrician. The slow vibrations of which I have spoken permit also that vexing conception of telegraphy without wires, without cables, without any of the costly installations which they now require. But why try to paint the wonders of the future? Has not our generation already found enough to admire?

A Novel Phone.

The "Theaterphone" is the latest in the way of telephonic communication. It supplies at private houses the music of the opera, or the active dialogue of any farce or comedy on the London stage.

All the hotels will place several of these wonderful phones in the public rooms, where, by dropping a shilling in the slot, one may enjoy ten minutes of the opera or theater. In Paris this instrument has already about one hundred thousand subscribers.



The Long-Distance Telephone Concert in Philadelphia.

THE clear and satisfactory was the transmission of the opening remarks, made in the office of the American Telephone and Telegraph Company, in Cortlandt street, New York City, to a large audience of prominent citizens of Philadelphia present at the Manufacturers' Club recently, to witness an exhibition showing the working of the long-distance telephone.

These were distinctly heard in the assembly room of the club by means of funnel-shaped receivers placed in the center of the room. The musical programme consisted of cornet solos, banjo and vocal music. President Dobson also held communication with a representative of the company, which was distinctly heard through individual receivers.

Another Telephone Line Put Up.

The telephone line between London and Paris has worked so well that another will be laid between London and Brussels.

Wanted, A New Invention.

Mental telegraphy is the invention that Mark Twain wants someone to investigate and produce. He says, in *Harper's Magazine*:

"This age does seem to have exhausted invention nearly. Still, it has one important contract on its hands yet, the invention of the phrenophone—that is to say, a method whereby the communicating of mind with mind may be brought under command and reduced to certainty and system. The telegraph and telephone are going to become too slow and wordy for our needs. We must have the thought itself shot into our minds from a distance; then, if we need to put it into words, we can do that tedious work at our leisure. Doubtless that something which conveys our thoughts through the air from brain to brain is a finer and subtler form of electricity, and all we need do is to find out how to capture it and how to force it to do its work, as we have had to do in the case of electric currents.

Heat Converted Into Electricity.

The expert reporter of the *London Times* tells us that a thermopile on view at the Frankfort Electrical Exhibition "showed a great advance upon all previous apparatus of this kind." A thermopile is a machine intended for the direct conversion of heat into electricity. All earlier instruments of this sort were deficient in

strength and durability. The improvement in the apparatus alluded to consists chiefly in the employment of a positive electrode of an alloy of antimony not easily fusible and very durable; further, in the use of nickel as negative electrode, and in an arrangement for preventing the overheating of the place of junction. The model shown has an electromotive force of four volts and a current of five amperes, at a consumption of 200 litres of gas per hour. The working expenses are about one farthing per hour. It will thus be seen that the machine per cubic meter of gas gives a total electrical energy of one hundred watts, while the best apparatus of this kind heretofore constructed only gave about twenty four watts per cubic meter of gas." Still more satisfactory results were obtained when coke was used as the heating agent.

An Electric Locomotive.

The first electric locomotive for trains of merchandise in the United States has just been finished in the workshops of the Thomson-Houston Electric Co., at Lynn, Mass. This machine is designed to effect transportation for this company over a length of 2,400 meters, between the railroad station and the factory of this company.

This locomotive is provided with a powerful motor of type G from the Thomson-Houston Co. It weighs 2,450 kilogrammes and is placed between the wheels: the whole, motor and wheels, being covered by a platform, behind which is contrived a covered space in which the mechanic and his levers are placed. The rear portion of the platform receives the merchandise. The electric current will be formed by a generator fixed in the shops of the company.

The Southern Telephone Company is considering building a line from Vicksburg, Miss., to Lake Providence, La.

Phonograph Concert.

AN INTERESTING EXHIBITION OF THE EDISON PHONOGRAPH IN CONNECTION WITH THE TELEPHONE.

The superintendent of the Pennsylvania Telephone Co., Mr. Henry Lewis, gave a concert at the telephone exchange in Easton, Pa., on Friday, March 1st, to guests assembled in Harrisburg, Pa., over one hundred and seven miles distant. Selections from De Wolf Hopper's comic opera, "Wang," a banjo solo by Dobson, of New York, comic and sentimental songs and the chimes of St. Thomas' Church, New York, were all perfectly reproduced.

This was done by using the new granular button long-distance transmitter on the Easton end of the line, the same which the telephone company is now furnishing to those subscribers who use long-distance instruments.

The faintest whisper can be heard by means of this transmitter. It has already been written about in THE PHONOGRAM. At the same time the Harrisburg guests were enjoying the music there, another party heard it as it passed from the phonograph to the transmitter in Easton.

The biggest natural beehive in the world is that in Kentucky known as the "mammoth beehive." It is really a huge cave, the main compartment of which is one hundred and fifty feet high, and whose floor covers ten acres in extent. The beehive is of solid rock, the roof of which has been entirely honeycombed by bees.

An amusing episode occurred on the electric railway, in Toronto, recently. An old lady hailed a car at a crossing and told the conductor she wanted to cure her rheumatism by having an electric ride. She got on board, sat down and proceeded a block. She then stopped the car declaring she was cured and expressed her gratitude to the conductor as she left.—*Canadian Electrical News.*



A GOOD MAXIM.



OME excellent advice, given in that most able and well-conducted shorthand journal, *The Stenographer*, published and edited by Mr. Francis H. Hemperley, of Philadelphia, Pa., is contained in the following paragraph.

“Do not advertise to write at the rate of one hundred and fifty words a minute when you cannot read what you have written at the rate of seventy-five words per minute.”

To the initiated these words convey volumes, and when we say the initiated we mean the thousand employers who have been hoodwinked into believing that good operators can be had by answering an advertisement worded in some such style as the following: “A rapid stenographer desires a position; can write one hundred and fifty words a minute.”

This is humbug, and none know it to be such better than the majority of people who read this advertisement. Business men rarely dictate over one hundred words a minute—frequently not over seventy; and it is a physical and mental impossibility for a stenographer (unless accus-

tomed to reference or court dictation) to maintain such speed. Again, premise that the feat is possible and is an ordinary accomplishment. Among the army of stenographers can they, or a majority of them, read these notes without difficulty? We reply emphatically, No! Therefore the maxim of *The Stenographer* is one that should find an echo in every student's mind.

But THE PHONOGRAM will indicate a method by which you can transcribe on the typewriter at the continuous rate of seventy-five words a minute with perfect ease and accuracy; and we also state, without fear of contradiction, that this can be done by the aid of a few lessons, and you can then so advertise without laying yourself open to criticism. To practice this method, you have only to learn how to use a phonograph. Schools are now open for imparting instruction in that art, and by giving close attention to the teachings one can learn in a very short period of time.

We therefore advise those whose attention has been attracted to this advertisement to ignore the suggestions therein proposed, and acquire a mastery of this

new instrument which fills all the needs of the case. Become a rapid and accurate typewriter operator, and it will not be necessary for you to write one hundred and fifty words a minute in order to get a lucrative position and HOLD IT.

Importation of salt.

The annual revenue drawn from salt in the Indies amounts to one hundred and seventy-five millions of francs. A great portion of the salt consumed is imported: little of this comes from the sea, but in return a considerable quantity is drawn from lakes in the Northwest, which are fed in the rainy season by waters that flow previously over saline districts: these lakes become dry in summer, and at that time the crystallized salt is gathered before further rains. Besides these sources of supply, there exist in the extreme North, mountains of salt, and these exploited by the government yield forty thousand tons of salt a year.

A German Invention.

In Germany an invention is noted which photographs the internal cavities of men and animals. Within a rubber tube is placed a small cylindrical dark chamber inclosed in a case equally cylindrical, provided with two hemispheric shutters (or doors). Two very small incandescent lamps are fixed in front of the lens. A battery for the lamps and a pneumatic ball to open the dark chamber complete the installation. A simple pressure of the ball pushes the dark chamber forward in the cylindrical case, at the same time that it effects the closing of the circuit of the lamps and the opening of the dark chamber doors. As soon as the pressure ceases the chamber resumes its place, the lamps are extinguished and the doors closed. Trials of the instrument have given very satisfactory results.

A New Phosphorescent Body.

Mr. Charles Henry has succeeded in manufacturing for industrial uses a body which chemists alone know how to obtain in a phosphorescent state, under special conditions, the sulphuret of zinc. This product will shortly be much sought by industrial firms.

This new body is unassailable by water and air, insoluble in ammonia, the feeble acids, etc. These characteristics distinguish it at once from the sulphurets of calcium, the only ones hitherto employed, which are changed by water and air, and therefore of restricted utility.

The sulphuret of zinc, which has a fine greenish-white luminosity at night, possesses an enigmatic luster in the dark or in the indistinct light of artificial lamps.

The cost of production, relatively small, will aid in its diffusion among the industries of dyeing, cleansing, and especially in the very complex manufacture of fine powders.

A microscope endowed with the power of enlarging to eleven thousand diameters, and destined to appear at the Chicago Exposition, has just been finished at the Physical and Optical Institute of Munich. The apparatus cost 45,750 francs. The lighting is furnished by the electric arc. —*Revue Scientifique*.

At the opening session of the Astronomical Society of France, Mr. Daubrée spoke of the perforating action of gas which has bored or scooped out in the granite of the terrestrial rind vertical chimneys 200 meters in diameter, which are at the present time filled with gold dust.

Mrs. Huggins, wife of the English astronomer, is a most able assistant to her husband in his astronomical labors, and keeps a record for herself of her observations.

PHONO CHAT.

The *Evening Star*, of Washington, D. C., has just issued a handsome little pamphlet on the subject of advertising, on the last page of which, under the head "Bureau of Advertising Writing," we find the following paragraph.

"For the more rapid and efficient performance of the work of this bureau, most of the matter is dictated to two Edison phonographs, and transcribed by fleet operators."

The *Star* is the leading Washington newspaper, and appreciates the value of labor-saving inventions.

The treatment and cure of deafness by the phonograph is developing so rapidly that the Columbia Phonograph Co., of Washington, D. C., have arranged to prepare and furnish to the medical profession the special cylinders which have been found in experience most valuable for treatment. These cylinders are indorsed by Dr. Garey as highly efficient for the purpose.

Mr. Gladstone manages to get along without stenographers for secretaries. His clerical assistants are the popular phonograph and long-hand writers.

Mr. Garner, who will try to demonstrate through the phonograph that monkeys have a language, might be the victim of a practical joke, should some mischievous person insert into the phonograph a dialogue between an Anglomaniac dude and one of our Bowery toughs. It might drive the expert phonographer and scientist crazy.

We have received the map, plans and illustrations of the Niagara Falls Water Power Co., and find it to be an excellent exposition of the work of that association. The plates are elegant, and the utilization of this enormous water-power will constitute one of the most gigantic strides in conquering force known to the world.

The Automatic Exhibition Phonograph Co. has moved into the Edison Building, 44 Broad street, New York City.

M. Camille Flammarion has reported the existence of stars which man has not seen nor will ever see, but of whose chemical composition, weight, movement, length of revolution and distance, the spectroscope is capable of informing us.

Instructions for Handling the Ideal Storage Battery for Phonograph.

BRADBURY STORAGE BATTERY CO., LOWELL, MASS.

When necessary to recharge the battery, it must be done either with a series (arc) circuit or straight incandescent circuit.

To charge from an arc circuit, connect battery in same way as an arc lamp. Positive (marked P) to positive wire using a dead cut out.

In charging from an arc circuit where current is 20 amperes (or less) types 11x and 9x can be charged where current is 10 amperes 7x, 7 x 2 and 7 x 3 can be charged.

To charge from an incandescent circuit, use sufficient resistance to reduce the current to normal charging rate of battery, connect the resistance coil in series with the battery and an ordinary double pole switch. Connect positive terminal of battery to positive main and negative to negative main through rheostat and switch.

Any number of cells may be charged at one time by connecting them in series negative to positive, and connecting end terminals same as one cell.

To find required resistance, subtract 2 1-2 times number of cells from voltage of circuit and divide by charging rate in amperes.

EXAMPLE.—On 110-volt circuit we desire to charge 4 cells type 11x at one time, 110 minus (4 x 2 1-2) divided by 20, (the proper charging rate for this cell), equals 5 ohms.

Time of charging.—This type of cell should receive from 350 to 400 ampere hours charge. Divide 350 or 400 by rate of charge gives the time necessary to charge cells.

Always switch battery on after starting and off before shutting down.

Keep the element of battery covered with the electrolytic fluid. By the aid of a funnel or syringe inserted in the rubber tubing, inject pure water until solution stands about half an inch above the plates.

In case the solution has been spilled out by accident during transportation, instead of using water to replace it, use a solution of one part chemically pure sulphuric acid to four parts water.

This should be 23° Baume or 1.178 specific gravity. Mix in a glass or earthenware vessel and pour it into the cell when cool.

Keep battery in a dry place.

In transportation protect your binding post

from coming in contact with any metallic substances by covering.

Do not spark the cells.

The life of a storage battery is lengthened by not completely exhausting it, and not allowing it to remain discharged.

RATE OF CHARGING CURRENT IN AMPERES.

Type.	Rate.	Ampere Hours.	Voltage When Fully Charged.
11x	20 to 25	400	2.5
9x	15 to 20	300	2.5
7 x 3	5 to 10	200	7
7 x 2	"	200	4.5
7x	"	200	2.3

READING NOTICES.

The best test of the merits of an article is the constant increase in the demand for same. John Underwood & Co., 30 Vesey street, New York, keep up the standard for typewriter ribbons, carbons, and all typewriting materials. If you purchase once from this firm, you will be sure to go again.

The Bar-lock Typewriter has for many years held a position in the front rank, and is now adding more improvements. To anyone contemplating the purchase of a typewriter "a word to the wise is sufficient."

Any person wishing to invest a small capital in a good paying business can find an opportunity by referring to an advertisement under the head of "For Sale" on page vii of this number.

If you are looking for a typewriter, call at the Typewriter Exchange, 10 Barclay street, New York, where the best value will be given for the least money. They have all the standard makes of machines.

Mrs. Harrison, wife of the President, has been chosen an honorary member of the association of the King's Daughters.

John Adams' Mirror.

A very old piece of furniture can be seen in the Vice-President's room at the Capitol, which has just been refurnished. It is a mirror, purchased by John Adams, in 1796, when he was Vice-President. He paid \$37 for it, and the committee rejected the bill on the grounds that to allow it would establish a dangerous precedent in extravagance.

CORRESPONDENCE.

New Zealand Notes.

The following is an excerpt from a letter received by our printers, Gibb Bros. & Moran, who have handed it to us for publication, as being of interest to our readers:

KAITANGATA, N. Z., January 26, 1892.

I have long wondered if it were possible to obtain a phonograph, but I cannot learn whether they are yet being manufactured for sale, or if they are at present only made for exhibition purposes. We have one in the city of Dunedin, on exhibition now.

Perhaps as you reside in the birthplace of this wonderful instrument, you could ascertain and let me know if I could procure one of the kind used in the ordinary way, or one of the slot phonographs which are operated by the dropping of a coin in the slot. I think one of the latter would pay excellently here as a commercial speculation if the cost did not amount to too much. Will you please ascertain about this? Yours, etc.,

J. A. A.

Washington Notes.

OFFICE OF EXAMINER BUREAU OF CLAIMS,
WASHINGTON, D. C., February 13, 1892.

MR. E. D. EASTON, President Phonograph Co.,
627 E street, N. W.

DEAR SIR:—My experience of six months in the use of the Edison Phonograph has been more than satisfactory. I find it a great convenience to be able to dictate a letter the moment I have determined the nature of the communication to be made; and the phonograph, which rests upon a bracket where I can reach it without leaving my desk or even moving my chair, enables me to do this without interrupting the transcriber. I am thus able to dispose of my correspondence, which is never less than fifty, and often one hundred letters per day, with greater rapidity, and more easily and satisfactorily, than would be possible if any other means were employed.

I have given the phonograph a thorough, practical test, and would not voluntarily discontinue its use. Aside from its great utility and convenience in dispatching business, it is more economical than the employment of stenographers, to which it is in point of accuracy and speed superior, and in no respect that I have been able to discover, inferior.

CARROLL D. JUDSON.

LAW OFFICE OF P. E. DYE, 514 Eleventh St.,
WASHINGTON, D. C. February 9, 1892
COLUMBIA PHONOGRAPH CO., 627 E street.

GENTLEMEN :—I have in use in my office two Edison Phonographs. It would be too great a loss to do without them, a loss I do not intend to suffer.

The Phonograph is one of the marvels of this age. For briefing for court or dictating correspondence it has no rival. It is simple, durable and easily operated. Its uses in the office are manifold. By its use a record is made exactly according to dictation.

I do not see how business men can afford to do without it; and certainly they will not, when once they learn what an aid it can be made in the dispatch of business.

P. E. DYE.

OFFICE OF C. A. SNOW & Co., Attorneys at
Law and Solicitors of Patents, 710 South
street, N. W.

WASHINGTON, D. C., January 26, 1892.
COLUMBIA PHONOGRAPH CO.

GENTLEMEN :—We have two Edison Phonographs, which are used constantly and exclusively by our Mr. Siggers in attending to our usual heavy correspondence. He has one phonograph on his desk ready for dictation at all times, while the other machine is kept constantly going by the typewriter in transcribing cylinders. We find this to be the most successful way to use the phonograph.

One does not have to stop the typewriter in her work of transcribing in order to take down new dictation. This feature alone should commend itself to all business men. It not only saves time and money, but the correspondence is attended to with less delay than when a stenographer is employed.

Yours truly,

C. A. SNOW & Co.

"THE EVENING STAR" BUREAU OF ADVERTISING WRITING, February 2, 1892.
COLUMBIA PHONOGRAPH CO., 627 E street,
N. W.

GENTLEMEN :—We have in this bureau two phonographs in constant use. We find them indispensable, especially so in times of great haste, as the advertising matter is dictated to one of the phonographs and the cylinder immediately passed to the other for transcription by the typewriter, enabling us to get up one or two columns of matter within the last hour or so in which the paper receives advertisements.

Another great advantage the phonograph enjoys over the stenographer is in being *always ready*, requiring no rest nor food, making no previous engagements, permitting us to talk to it all day and as many evenings as we may desire, *without a single word of complaint or a request for an increase in salary.*

I predict that the time is not far distant when the phonograph will be in universal use by all busy men who desire to accomplish the *maximum* of work at the *minimum* of cost and effort.

Yours very truly,

WM. A. HUNGERFORD,
Business Writer.

Florida Notes.

Editor PHONOGRAM :

We have just removed our office from our old quarters, at 26½ Newman street, to Room I, Mohawk Block, on East Bay street. This is one of the newest and finest blocks in the city and one of the best locations. The post-office is located on the corner of this building, and our office is situated just across the hall from the United States court room. The building is rapidly filling up with lawyers and other professional men. We have one of the best offices in the block fronting on Bay street, which is one of the most prominent business streets in the city. We have furnished our office with handsome oak and walnut furniture; we have a battery-room and work-room attached, in which we do all repairing, etc. We have recently been extending our automatic phonographs to several of the smaller towns, with gratifying results, and hope for a prosperous season, notwithstanding the late period at which we began operations.

We have not experimented with many types of batteries. Our experience with the old Chromic acid battery was similar to that of other phonograph companies and not a successful one, and we gladly welcomed the improved batteries of other makes that came into the market. We used a few primary batteries, but while they were satisfactory in some instances, they were generally pronounced cumbersome and disagreeable to work with, by parties who used them.

All of our lessees who formerly had these batteries have returned them and are now using the storage cell. They said that the charges of potash and zinc, etc., did not consume evenly, and sometimes wasted away so rapidly that they did not get the one hundred

hours work for the phonograph which they expected. We first used the Pumpelly cells, but found that they were not constructed to admit of shipping without carefully boxing and packing. We have been using the Anglo-American batteries for some time past and have been much pleased with them. We think, however, that the cells now made for use with the phonograph are entirely too weighty. We estimate that we will have to renew our entire plant about every two years, or perhaps a little longer. If the phonograph companies calculate on renewal of such an important item in their plant every few years, it will be quite a serious consideration. Our idea of a perfect battery for phonograph use is one that will unite in itself light weight, compactness, to admit of convenient handling, long life, easy and simple storing, and durability of elements.

West Virginia Notes. |

Mr. J. C. Jerold, representing the Western Pennsylvania Phonograph Co., has been in Wheeling, West Va., exhibiting the phonograph recently. Mr. Jerold gave some very amusing and interesting exhibitions of this instrument to a wondering and enthusiastic audience. He says the machine is coming into use in many ways never dreamed of at first. He relates that a noted Pittsburgh physician has been able to catch the death rattle of a patient who recently died in the hospital in that city.

Mr. Jerold is introducing the phonograph into all the leading hotels, public resorts and railroad offices in Wheeling, and also into many private houses. He called at the Convent of Mt. de Chantal and gave the sisters and pupils a rare treat in the shape of classic and popular music through the phonograph, and also placed a blank cylinder and recorded on it a piano solo played by Miss Blanche Moran, a pupil. It was afterwards reproduced on the phonograph to the great delight of the young ladies. The phonograph plays an important role in school work, as, when properly understood, it demonstrates the vibrations of sound as nothing else can.

Among the structures recently erected in the *Garden of Acclimatation* it is proper to note the new gallery of the museum of hunting and fishing.

Chicago Notes.

CHICAGO, February 25th, 1892.

Editor PHONOGRAM:

I am in receipt of your favor of present date requesting me to write an article for the next number of THE PHONOGRAM in regard to the importance or necessity of establishing schools for educating typewriters in the use of the phonograph. I think that the education of the typewriters would help a great deal toward introducing machines into business offices, but can hardly conscientiously urge upon other people the expediency of doing what I do not do myself, as there is no such school in Chicago at the present time. One or two typewriter firms have phonographs, and allow operators who use their machines to practice with the phonograph whenever they have the time and inclination. We have at different times tried to get the typewriter operators interested in the phonograph, and advertised instruction free. I think, however, we have made it too cheap. Operators have come into our office by the score, and after using phonograph and typewriter together for an hour or so for a couple of days in succession, concluded that there was nothing more to learn, they knew all about it, and that they would not waste any more time upon it. They got a very imperfect knowledge of how to operate the machine, and when we called upon them later to take positions they were unable to fill them. It is my intention, however, in the near future to make another effort in this direction, and establish a phonograph school, in which competent typewriter operators can learn the use of the phonograph thoroughly by payment of a fee of an amount that will pay the expense of teaching them. If they have a little money invested in it they will take more interest in learning, and the amount they pay could be returned to them when they had attained a certain degree of proficiency in the handling of the phonograph. If this was made known to them at the time they paid their money, or later in the course, it would be an additional motive for them to keep up the work. I do not think it is practicable to introduce the phonograph into shorthand schools, as wherever I have seen this tried, the teachers have given the phonograph a "black eye," and in some cases of which I know, have only taken the phonograph into their schools at all for that purpose. If any of the other companies

have had any experience in this line, I should be very thankful for any pointers.

Yours very truly,
W. S. GRAY, Manager,
Chicago Central Phonograph Co.

World's Fair Notes.

The contracts for the electric lighting of the Exhibition buildings will be fifty in number and require great labor and cost to fill. The directors will spend \$1,000,000 for these plants. There will be used 127,000 lamps. All electric firms may compete here, and the result will be a pleasing variety of form and quality.

A sheet of water running from the lake to the Administration building will be illuminated by 1,650 incandescent lamps, which are to be placed two feet apart and three feet above the surface of the water of the basin.

An exceedingly interesting paper was recently read by Mr. James Dredge, of the British Royal Commissioners, before the Society of Arts in London, wherein he set forth an account of the scope and plans of the Exposition, which created so much interest in England that the press of that country gave extended notices thereof.

Japan offers, if granted a site in Jackson Park, to erect several buildings illustrating the ancient style of architecture in that country. The Mikado proposes to reproduce the monastery of Kinkakuja, dating from 1397, and Ho-o-do, or Phoenix Hall, representing that fabulous bird from which it is named. These will cost Japan \$100,000 and will be presented to Chicago after the close of the Exposition.

Query ?

January 30, 1892.

To the Editor of THE PHONOGRAM :

I have leased territory and am operating phonographs. Being a beginner in the business, I have some trouble occasionally with my nickel-in-the-slot machines and sometimes am slow in finding out the cause. Am learning by experience, a slow way. I would like to have a book or pamphlet of instructions. Is there one published that would be of use to me? If so, I would be glad to have you send me a copy. Is there any book giving details of the management of the phonograph,

how to handle cylinders, their number of times of reproduction, etc., etc.?

I am very much pleased with your magazine.

Very truly yours,

D. W. M.

(1.) There are so many devices for operating nickel-in-the-slot machines that no single book of instruction could apply to all, and you, as a beginner, are doing as the rest have done—*learning by experience*.

(2.) No book of the kind published. The instructions are given by experts in the employ of the district companies.

Phonogram Sunbeams.

LINOTYPE REPORTING AND PRINT-
ING Co., 31-32 Park Row,
NEW YORK, February 17, 1892.

V. H. McRAE, Editor THE PHONOGRAM :

I must pause in the whirl of business to indite a line in praise of your last issue of THE PHONOGRAM. It certainly is a most creditable production, full of interesting information, and beautiful in typographical appearance. It is a number that certainly will be appreciated by all who are interested in the subject of "the machine that talks."

I wish you all the success that your efforts so richly deserve.

JAMES O. CLEPHANE, President.

CHESTERTOWN, MD., February 4, 1892.

Herewith inclosed my subscription to THE PHONOGRAM for the ensuing year. I have always read your numbers with interest, and they are instructive as well as most interesting. HOPE H. BARROLL, Attorney-at-law.

We are much pleased with the last issue. Your energy and persistence should certainly bring success.

E. D. EASTON,
President of the Columbia Phonograph Co.,
627 E street.

The last issue of THE PHONOGRAM was an excellent number. Your editorial, "Mr. Edison's Forecast," and Mr. Edison's article on "Reporting by the Phonograph" are unusually good.

HUGH R. CONYNGTON,
Secretary Louisiana Phonograph Co.

February 20, 1892.

We are kept busy and are steadily gaining ground, and are rapidly getting to a cash basis.

We are using THE PHONOGRAM right along as an efficient advertising medium of the phonograph. TEXAS PHONOGRAM CO.,
Galveston, Tex.

We are glad to hear that the demand for THE PHONOGRAM is so great, and we regard your last number as a very fine edition in all respects.

JAMES L. ANDEM,
President Ohio Phonograph Co.

Authors and Publishers.

The decennial number of the *Electrical Review* is a model of elegance both in matter, garb and illustration, while the perfection of its printing gives it special value to readers. It is a great credit to its enterprise.

The views of the city of Buffalo, where the National Electric Light Convention was recently held, are beautifully presented and evidently show that things are booming in the "Queen City."

The *Continental Illustrated Magazine* for February contains choice literature, and its plates possess the distinctive merit of correct expression wherever the human face and form are depicted, which cannot always be said of the finest engravings or cuts. The likenesses of the late Duke of Clarence are among the very best.

We acknowledge the following new publications: *The Reform Advocate*, first anniversary number, published by Messrs. Bloch & Newman, Chicago, and edited by Dr. Emil G. Hirsch, in the interest of Reform Judaism; *The Presto*, a weekly musical journal, 323 Dearborn street, Chicago; *The Catalogue of the St. Louis Post-Graduate School of Medicine* and the *Trade Press List*, a catalogue of the trade press of America, published in Jersey City, N. J.

The Engraver and Printer, a monthly published by Henry L. Johnson, at Boston, Mass., is a thing of beauty. These plates seem by the engraver's art to reflect, as a mirror does, the most minute object within the range of their action; the twigs the leaves, the blades of grass, the sheen of waves, the mist, the very atmosphere, just as the masters used to paint it.

Ce sont des tresors de science et d'erudition que *La Revue Scientifique* apporte tous les mois à nous autres Americains, et ce journal est une fontaine rafraichissante sous tous les rapports. Soit dans les matieres de chimie, de demographie, d'inventions ou d'informations variees, tout est d'une excellence rare.

Par consequent il est toujours le bienvenu dans les salles du Phonogram, comme ailleurs.

Mr. Caspari explained the theory of the employment of chronometers for determining longitudes, by comparing the hour of the initial meridian with that of the point at which the observer was placed, calculated according to the position of the sun or the stars.

Analogical Syllabic Shorthand.

We have received and read with pleasure Mr. Francis H. Hemperly's treatise and exemplification of the art of shorthand as embraced in the book recently published bearing the above title. The preface to this manual contains a succinct statement, not only of his methods, but of the facts upon which they are founded: the wisdom of centuries teaches us that by "continual use" an accretion of knowledge gathers round any given subject or point, and this holds good in the material world as well as the world of ideas and goes largely to explain the meaning of what is known as development.

In the planetary system, nebulous matter while whirling through space draws around it a volume of ever-increasing substance. The atoms seem to seek each other. In the realm of the mind the same conditions exist. Mr. Hemperly says: "We have kept in mind the fact that the laws of mind action very largely control the hand motion. We have regarded the syllable as the unit of word analysis."

He continues: "A stem bearing certain modifications indicates the consonant with its various positions; the vowel sounds are known by the position of the stem with reference to the line—and thus a pen-picture is made of the words and ideas dictated by a speaker to a stenographer. The rule of 'a simple sign for a simple sound and a compound sign for a compound sound' carries the mind along without confusion or inversion. Continuity, logical sequence and analogy are kept in view."

The Hottest Place on Earth.

It is said that the hottest place in the world is situated in Southeastern California, and is called Death Valley. In July, a thermometer placed in the shade registered 130. This valley was once a lake of water containing in solution common soda, salt and borax, and above the marsh there is a crust of common salt twelve inches thick. The borax deposits on the east side of the valley are said to be the richest in the world. No rain falls in Death Valley throughout the year and persons who enter there have to take supplies of water with them.

HUMPHREY'S MANUAL OF TYPE-WRITING,

Business Letter-Writer,

AND

EXERCISES FOR PHONOGRAPHIC PRACTICE.

A GUIDE TO THE ART OF TYPE-WRITING,

BY F. S. HUMPHREY.

PRICE, - - - - \$1.50.

Manual of Phonography. By BENN PITMAN, 16mo., boards, 80 cents, extra cloth,	\$1 00
Phonographic Reader. By BENN PITMAN, 16mo., paper.	25
Reporter's Companion. By BENN PITMAN, 12mo., boards,	1 00
Phrase Book. A very valuable book to the practical reporter, as it contains over six thousand of the most frequently- occurring and useful phrases, written in the briefest and most legible manner. By BENN PITMAN, 16mo., extra cloth,	1 00
Phonographic Dictionary. By BENN PITMAN and JEROME B. HOWARD, 12mo., cloth,	2 50
Eclectic Shorthand. By PROF. J. G. CROSS, M.A. Thirty- first edition, 12mo., cloth,	2 00
Dictionary of Eclectic Shorthand, giving the phonetic and shorthand equivalents of the primitive words, and the various classes of derivative words of the English lan- guage, also several vocabularies of technical terms. By J. GEO. CROSS, M.A., 8vo., cloth,	3 00
Hand-book of Standard Phonography. By ANDREW J. GRAHAM, 12mo., cloth,	2 00

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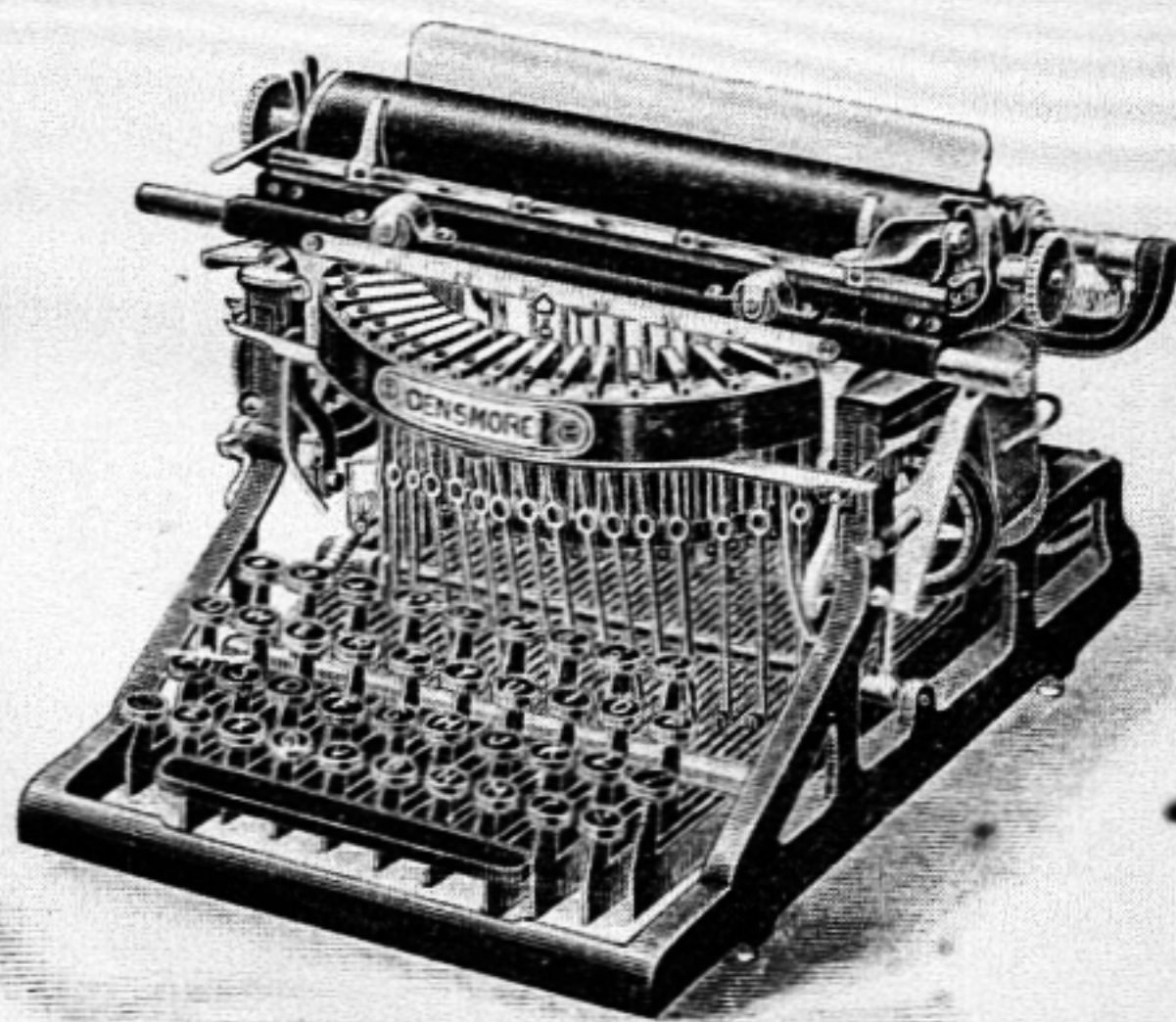
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PHONOGRAM OFFICE,

Room 87.

WORLD BUILDING.

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DENSMORE ✧
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"IMPROVEMENT IS THE ORDER OF THE DAY."



The New Special No. 3 Caligraph has met with universal favor because it has two interchangeable platens, which can be adjusted in less than thirty seconds, enabling an operator to produce the work of two machines from one; because it has a positive ribbon movement, which presents a fresh surface of the ribbon for each type impression; because it has a wheel dog stay and six additional characters; because it has a hollow type bar, which gives lightness and strength; because it has an adjustable type hanger, which gives permanent alignment; because it has a key for every character and an adjustable feed guide. In fact, the Special No. 3 Caligraph is the acme of perfection in typewriters.

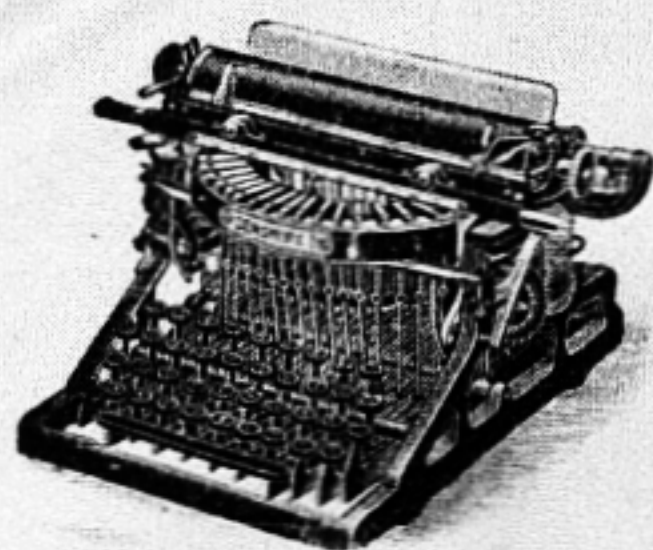
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Invented, owned and controlled by men having had fifteen years' experience on type-bar machines. SIMPLICITY, STRENGTH, DURABILITY, HIGH SPEED, EASY ACTION, PERMANENT ALIGNMENT. Most convenient. Two interchangeable carriages. Steel throughout.

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We will appoint a reliable dealer in all cities as soon as possible, and in the meantime will ship machines on approval to parties having a good commercial rating.

DENSMORE TYPE-WRITER CO., 202 Broadway, New York.

"A perfect machine. Am delighted with it. A pleasure to run it." CHAS. D. KELLY, Stenographer West Shore, R.R. New York.

FOR SALE.

Good Territory for Phonograph business with Slot Machines, Batteries and all property now on hand. Splendid opportunity for young man with about \$3,000. Address

A. B., Care of THE PHONOGRAM.

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Jerome B. Howard, Editor.

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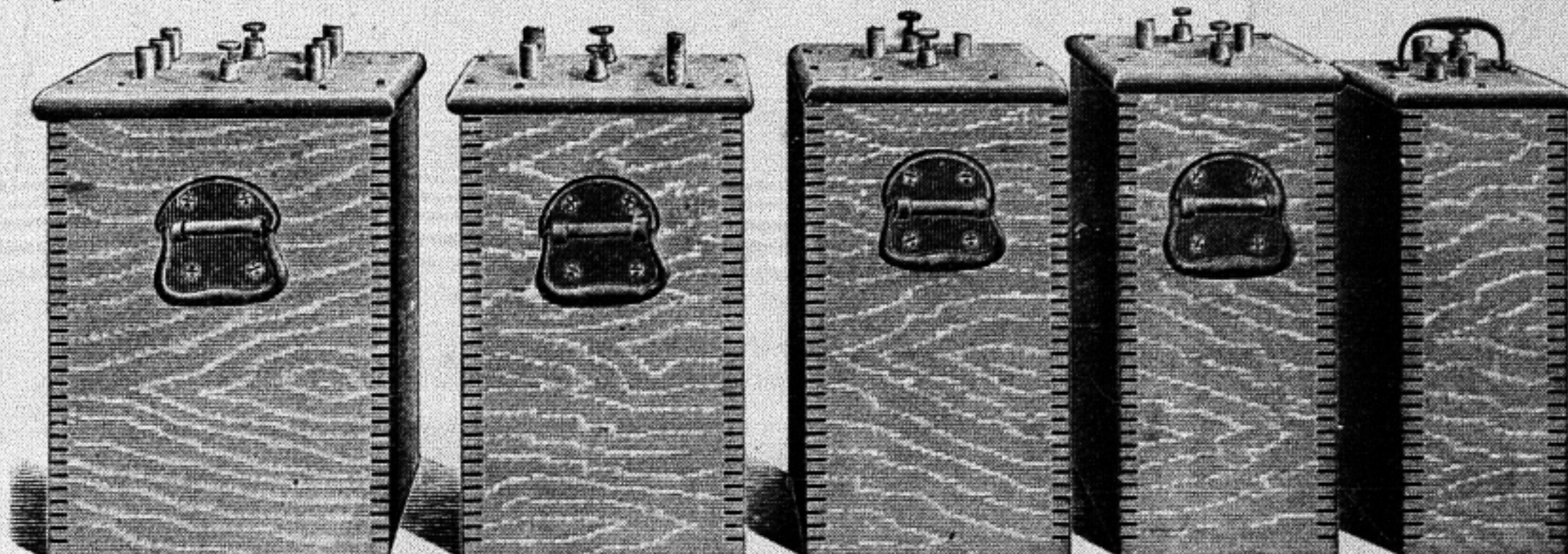
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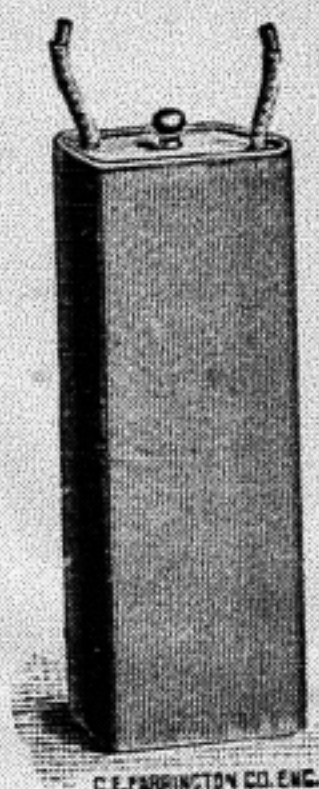
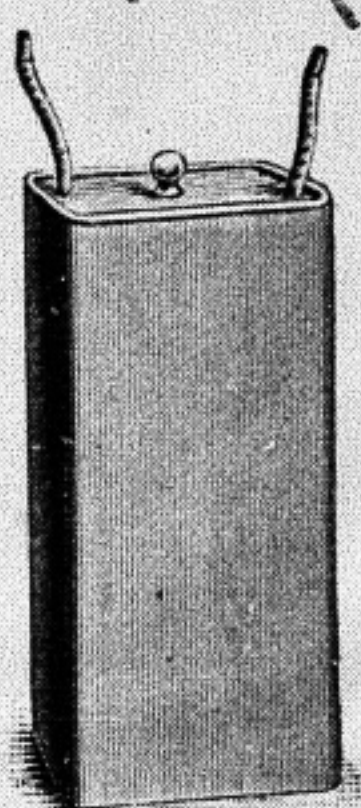
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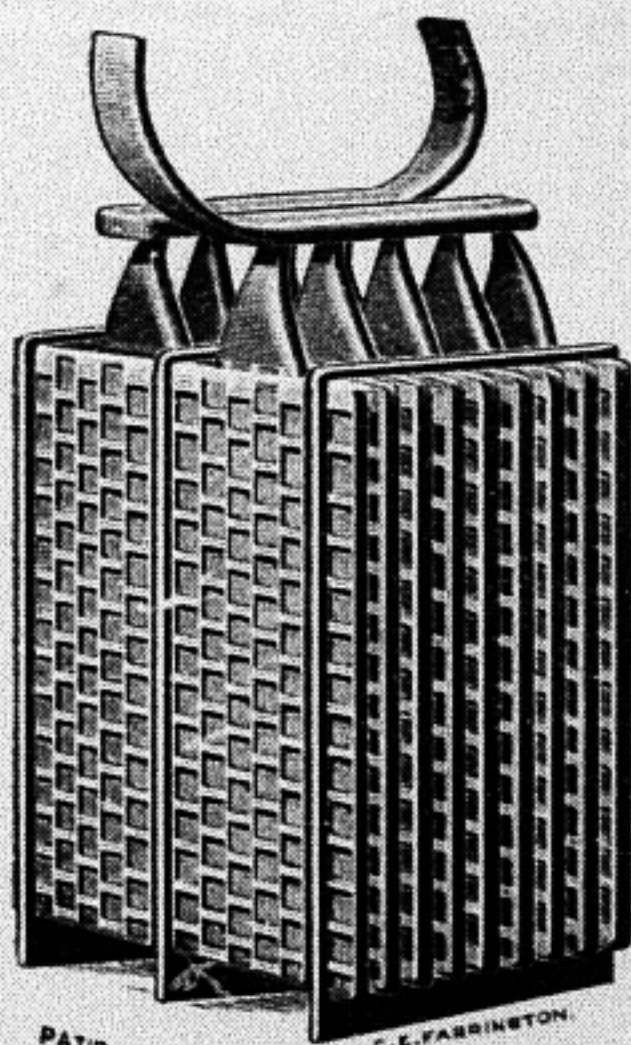
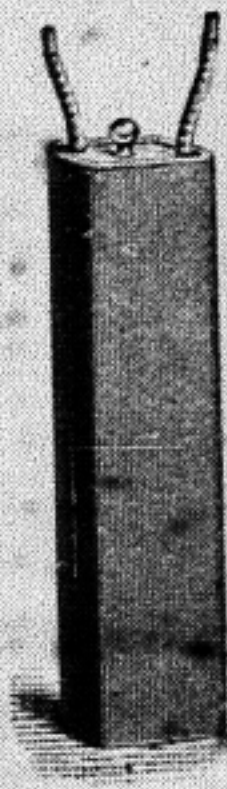
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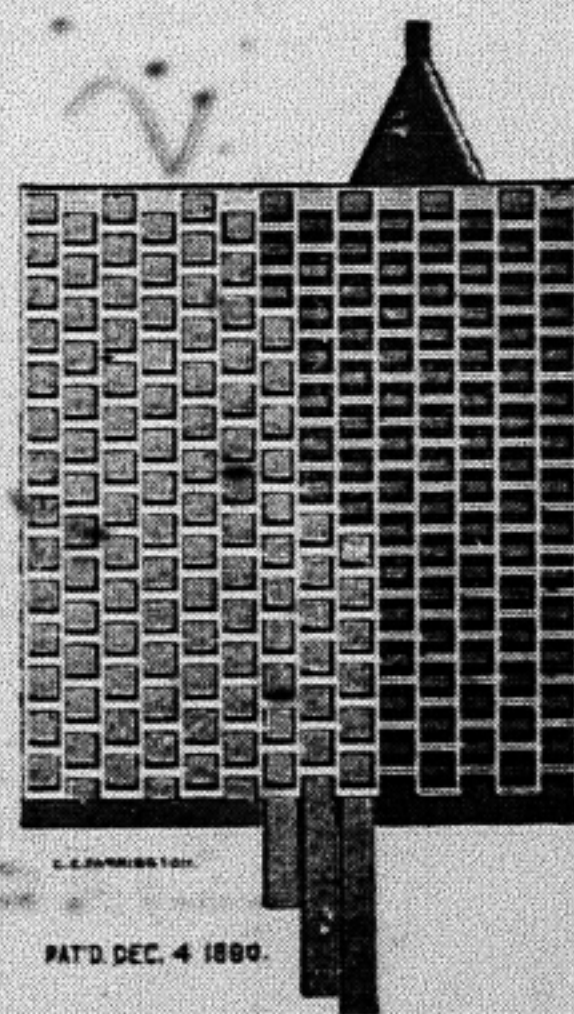
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